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FEDERAL COMMUNICATIONS COMMISSION
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In re Applications of	)	File Nos.
	)	
E-SAT, INC.	)	24-SAT-P/LA-95
	)	
FINAL ANALYSIS COMMUNICATION SERVICES, INC.	)	25-SAT-P/LA-95
	)	
GE AMERICAN COMMUNICATIONS, INC.	)	26-SAT-P/LA-95
	)	
LEO ONE USA CORPORATION	)	57-DSS-P/LA-94(48)
	)	27-SAT-AMEND-95
	)	
ORBITAL COMMUNICATIONS CORP.	)	28-SAT-MP/ML-95
	)	
STARSYS GLOBAL POSITIONING, INC.	)	31-DSS-AMEND-94
	)	32-DSS-LA-94
	)	
For Authority to Construct, Launch, and Operate a Non-Voice, Non-Geostationary Mobile Satellite System	)	

Received
1995
Satellite and Radiocommunication Division
Satellite Policy Branch

CONSOLIDATED PETITION TO DENY

Submitted by:

CTA COMMERCIAL SYSTEMS, INC.

Jill Abeshouse Stern
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2300 N Street, N.W.
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(202) 663-8380
Its Attorneys

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SUMMARY

CTA Commercial Systems, Inc. ("CTA") hereby petitions the Commission to dismiss or deny four of the applications submitted on November 16, 1994 in the second-round filing window for Non-Voice, Non-Geostationary Mobile Satellite Service (NVNG MSS) systems. CTA and others have previously petitioned to deny the Leo One application.

The second-round applications of Final Analysis, E-SAT, GE Americom and Orbcomm do not meet the threshold financial, technical and/or legal qualification standards applicable to the NVNG MSS and must therefore be dismissed or denied.

- Final Analysis has failed to show that it has sufficient current assets or operating income available to cover the costs of constructing, launching and operating the first two satellites in its proposed system, and therefore lacks the requisite financial qualifications. Its application is also technically flawed because it fails to comply with the Commission's technical rules and requirements relating to protection of existing users in the allocated frequency bands.

- E-SAT has failed to submit an adequate management commitment letter from its corporate parents and thus its application must also be dismissed for lack of financial qualifications. Technical flaws in the E-SAT system design provide additional grounds for its dismissal. The proposed 6-satellite system is highly inefficient, in terms of its limited coverage, excessive uplink error rate, and significant service disruptions that will be experienced. This inefficient system should not be permitted to preclude more efficient systems from using the limited spectrum resource.

- Orbcomm 's proposal to add satellites and use new spectrum (6 additional channels) must also be denied under long-standing Commission policies which require satellite licensees to demonstrate need for expansion satellites, particularly where there are competing demands by new entrants. Orbcomm has failed to make the requisite showing of need for expansion of its satellite system which was licensed a few short months ago and is not yet operational. Indeed, it appears that the primary purposes of the modification could be achieved more efficiently without the need for extra channels.

- While GE Americom clearly has sufficient assets to fund its proposed system, the absence of a management commitment to the project raises serious questions as to whether, in fact, the company is prepared to proceed expeditiously with system implementation. GE's failure to submit a management commitment requires denial of its application or, at a minimum, further inquiry into whether the company intends to provide the necessary financial support for the proposed project.

- Finally, in light of the demand for the limited NVNG MSS spectrum that is now available, the Commission should quickly require Starsys to make a financial showing and rule on the qualifications of this first-round applicant. The continued uncertainty relating to Starsys' status is highly prejudicial to the second-round applicants who must evaluate the availability of spectrum and sharing considerations that may apply to use of the allocated bands.

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CONSOLIDATED PETITION TO DENY

CTA Commercial Systems, Inc. ("CTA"), by its attorneys, hereby submits this "Consolidated Petition to Deny" the above-referenced applications in the Non-Voice, Non-Geostationary Mobile Satellite Service ("NVNG MSS").

I. INTRODUCTION AND SUMMARY

On November 16, 1994, in response to the Commission's Public Notice establishing a second round filing window for NVNG MSS applications,[1/] CTA submitted applications for authority to construct, launch and operate the GEMnet satellite system. GEMnet will utilize thirty-eight low-Earth orbit satellites to provide a variety of innovative global communications services, including asset tracking and monitoring, utility meter reading, E-mail, paging and buoy/environmental sensor reading. In developing the GEMnet system, CTA plans to rely upon the technical expertise and financial support of its parent company, CTA INCORPORATED, a fast-growing high technology company with revenues in excess of $140 million in 1993.

As detailed in CTA's application, CTA and its parent company are uniquely qualified to develop and implement the proposed satellite system. CTA INCORPORATED has extensive experience in the development and manufacture of small geostationary and low-Earth orbiting communications satellites. Among CTA's twenty-one successful small satellite programs are the two-satellite MACSAT communications satellite program and the seven-satellite Microsat program, both of which were developed for the Defense Advanced Research Projects Agency. The MACSAT satellites were used by the military for store-and-forward communications during the Gulf War. The Microsat program, launched in 1990, used a constellation of seven "lightsats" to provide mobile telephony for the military. Current small satellite projects include a technologically-advanced remote sensing satellite being developed for NASA and a direct broadcast satellite for Indonesia.

[1/] See Public Notice, Report No. DS-1459, DA 94-1011, released September 16, 1994.

In addition to CTA's application, there are now six other second-round NVNG MSS applications on file with the Commission. Proposals for new commercial satellite systems have been filed by Leo One USA Corporation ("Leo One"); E-SAT, Inc. ("E-SAT"); Final Analysis Communication Services, Inc. ("FACS"); and GE American Communications, Inc. ("GE Americom"). A modification application was filed on November 16, 1994 by Orbital Communications Corporation ("Orbcomm") in connection with its recently-issued NVNG MSS license, and Volunteers In Technical Assistance ("VITA") submitted an amendment to its pending first round application. All of these applications have essentially requested to be accommodated in the same frequency bands: 137-138 MHz; 148-149.9 MHz; and 400.15-401 MHz.

Based on its analysis of the six new NVNG MSS proposals, CTA has reached a preliminary conclusion that the currently allocated spectrum is insufficient to accommodate more than one of the proposed systems assuming that all of the first-round systems are licensed.[2/] For this reason, CTA is convinced that the United States must vigorously pursue allocation of 7 to 10 MHz of additional NVNG MSS spectrum below 1 GHz at the upcoming 1995 World Radiocommunication Conference (WRC-95), if new systems (within the United States and worldwide) are to be implemented by the year 2000. CTA is actively participating in preparatory activities relating to WRC-95 and plans to file detailed comments urging the United States to support additional NVNG MSS spectrum allocations at WRC-95 in response to the Commission's Second Notice of Inquiry in IC Docket No. 94-31.[3/]

[2/] A Technical Appendix is attached hereto which provides greater detail about the capacity of the existing spectrum allocation and CTA's analysis with respect to the number of systems that can be accommodated.

[3/] Second Notice of Inquiry, IC Docket No. 94-31, FCC 95-36, released January 31, 1995.

Although it is hoped that additional NVNG MSS spectrum will be identified and allocated expeditiously, the current reality is that there are too many second-round systems to be accommodated in the existing spectrum. For this reason, it is vitally important for the Commission to ensure that all applicants meet the threshold financial and technical qualification standards for NVNG MSS systems. Only qualified entities can and should be licensed to use the scarce spectrum resource that is now available. Unqualified applicants should be promptly denied or dismissed so that qualified companies can move forward.[4/]

The Commission has ample authority to deny outright without a hearing patently defective applications. Section 308(b) of the Communications Act, as amended, provides that "[a]ll applications for station licenses ... shall set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical and other qualifications of the applicant..." 47 U.S.C. § 308(b). The Commission need not accept for filing or hold a hearing on applications that fail to meet these requirements or that do not provide the basic information deemed necessary for a consideration of their merits." See, e.g., United States v. Storer Broadcasting Co., 351 U.S. 192, 202, 205 (1956); Aeronautical Radio, Inc. v. FCC, 928 F.2d 428, 438-39 (D.C. Cir. 1991); Salzer v. FCC, 778 F.2d 869, 877 (D.C. Cir. 1985); Ranger v. FCC, 294 F.2d 240, 242-43 (D.C. Cir. 1961); In re Advance, Inc., 88 F.C.C.2d 100, 106-07 (1981).[5/]

As detailed below, three of the second round applicants, E-SAT, FACS, and GE Americom, have failed to meet the Commission's financial standard for NVNG MSS systems, despite

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[4/] Prompt elimination of unqualified applicants would also facilitate settlement or cooperative arrangements, if necessary, between any remaining applicants.

[5/] See also 47 C.F.R. § 25.112

the relatively lenient nature of that standard. These applications must therefore be dismissed. Technical deficiencies in the E-SAT, FACS and Leo One applications provide additional grounds for dismissal of these applications. Orbcomm's modification application should be denied on the grounds that, as a newly-licensed company seeking expansion spectrum, it has failed to show need for the additional spectrum it is requesting contrary to long-standing Commission satellite policies.

CTA filed a petition to deny the Leo One application on November 16, 1994. On that date, several other parties filed petitions and comments questioning Leo One's financial ability, the reasonableness of its cost estimates, and its character and technical qualifications.[6/] Particular concern has been expressed as to Leo One's "novel" use of a private trust to finance its satellite system and to shield inquiry into its financial and legal qualifications. None of these deficiencies was cured or even addressed by Leo One's November 16, 1994 amendment.

II. FINAL ANALYSIS HAS FAILED TO DEMONSTRATE ITS FINANCIAL AND TECHNICAL QUALIFICATIONS TO BE A COMMISSION LICENSEE

A. Final Analysis Is Not Financially Qualified

Commission Rules 25.142(a)(4) and Rule 25.140 require NVNG MSS applicants to demonstrate sufficient current assets and operating income to meet the costs of construction,

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[6/] See Comments and Provisional Petition to Deny of Starsys Global Positioning, Inc.; VITA Petition to Deny; Peition to Deny or Dismiss of Final Analysis Communication Service, Inc.; Comments of Orbital Communications Corporation.

launch, and first-year operation of the first two satellites in the proposed system.[7/] "Failure to make such a showing will result in the dismissal of the application." 47 C.F.R. § 25.140 (b)(2); 47 C.F.R. § 25.142(a)(4).[8/] As shown below, on its face, the FACS application fails to demonstrate financial qualifications and must therefore be dismissed.

In its application, FACS proposes to rely on internal funding by its parent company, Final Analysis, Inc. ("FAI"), in order to meet the requisite system costs. FACS estimates that the two-satellite system costs will be $6.2 million. As purported evidence of ability to meet these costs, FACS submits (1) a management letter of commitment from FAI President Nader Modanlo to the FCC; (2) a balance sheet for FAI for the 1993 calendar year listing total assets of $590,528.00; (3) a balance sheet for FAI for the months of January through October 1994 listing total assets of $10,464,778.00; and (4) letters from Business Accounting Services providing the opinion that the financial statements fairly present the companies' financial position.[9/] Under the Commission's Rules, FACS has failed to demonstrate its financial qualifications.

The express terms of Commission Rules 25.140 and 25.142, and long-standing Commission precedent, require satellite applicants to provide evidence of sufficient current assets or

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[7/] 47 C.F.R. § § 25.140(d) and 25.142(a)(4). See also Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile Satellite Service, 8 FCC Rcd 8450 (1994) (hereinafter "Little Leo Order"), ¶ 5. See also Orbital Communications Corporation., 9 FCC Rcd 6476 (1994) (hereinafter "Orbcomm Licensing Order").

[8/] In proposing this financial standard, the Commission stated the general principle that: "Examination of an applicant's financial qualifications ensures that the orbit-spectrum resource is not tied up by entities unable to fulfill their plans, discourages the filing of speculative applications that occupy Commission resources, and promotes the prompt availability of service to the public." Notice of Proposed Rulemaking, CC Docket 92-76, FCC 93-28, released February 10, 1993 at ¶ 17.

[9/] FACS Application at VII-1, Exhibits VII-1,3,4.

operating income to the extent that the company is relying upon internal funds to demonstrate its qualifications.[10/] Neither of the balance sheets submitted by FACS is adequate in this regard. FACS clearly lacks sufficient current assets under the applicable financial test and its application must therefore be dismissed.

In specifying that an applicant must demonstrate sufficient current assets, the Commission's choice was intentional. Current assets, which include cash, inventory and accounts receivable, "provide a general measure of a company's ability to raise funds on the basis of its on-going operations."[11/] This measurement is "an administratively convenient and useful way to enable [the Commission] to determine an applicant's current access to financial resources."[12/]

Current assets are defined as "cash plus other assets reasonably expected to be realized in cash or sold or consumed during a normal operating cycle of a business."[13/] Under this test, FACS and its parent company clearly lack sufficient current assets. According to financial information submitted by FACS, FAI's current assets are less than $1 million. FAI's balance sheet lists cash assets of $86,873.00 and accounts receivable of $612,722.00, plus net operating income of $1.2 million. The total of current assets and operating income is therefore about $2 million: roughly $4 million short of the $6.2 million required to meet the Commission's financial requirements.

[10/] See, e.g., Licensing Space Stations in the Domestic Fixed-Satellite Service, 58 R.R. 2d (P&F) 1267, 1272-3 (1985) (hereinafter "1985 Domsat Order").

[11/] Id. at 1272-3.

[12/] Id. at 1273, n.24.

[13/] Id.

While FAI may own equipment, or other non-current assets, valued at $10 million, these assets are irrelevant to the Commission's financial standard. Nor has FAI provided any evidence of external funds that have been committed to the project. The FACS application is therefore patently defective on its face and must be denied for non-compliance with the Commission's threshold qualification standards.

B. The FACS System Is Technically Flawed

The Final Analysis application is also deficient because the company has failed to demonstrate its ability to share with government systems in the allocated frequency bands as more fully detailed in the attached Technical Appendix. As designed, the FACS system cannot be coordinated with Federal government users as required by Commission Rule 25.142 .[14/] The application must therefore be dismissed.

Final Analysis is proposing to operate subscriber uplinks at data rates that will cause increased interference to existing terrestrial users. The company proposes to operate fourteen 25 KHz channels at 9.6-19.2 kbps. This channelization plan does not accommodate the existing RF channel structure based on 25 KHz grids. As designed, the FACS system will therefore overlap with terrestrial channels and cause interference to government users.

[14/] See Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites, 8 FCC Rcd 1812 (1993).

In order for FACS to co-exist with terrestrial systems (and other NVNG MSS systems) it will need to reduce its data rates to 4.8 bps and channel bandwidth to 10 KHz.[15/] This reduction in data rates will result in a substantial (about 75%) reduction in the number of subscribers that can be supported by the system. For this reason, the efficiency and service capabilities of the FACS system is far less than stated in the application. Further technical deficiencies in the FACS design are detailed in the attached Technical Appendix.

III. E-SAT HAS FAILED TO MEET THE APPLICABLE FINANCIAL AND TECHNICAL QUALIFICATION STANDARDS

A. E-SAT Lacks Financial Qualifications

In its application, E-SAT estimates that the total cost for construction, launch, and first-year operation of the first three satellites in its system will be $33 million.[16/] To meet these costs, E-SAT proposes to rely upon internal funding by one of its parent companies: Echostar Communications, Inc. ("Echostar") . There is no financial information submitted for Direct Broadcast Systems, Inc. ("DBSI"), E-SAT's other corporate parent. However, E-SAT's application is devoid of any evidence of commitment to the proposed satellite program by Echostar or any other party. Its application is therefore defective and must be dismissed.

Rule 25.140 (d)(1) clearly states that: "If the applicant is owned by more than one corporate parent, it must submit evidence of a commitment to the proposed satellite program by

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[15/] The Leo One system suffers from the same technical defect. Leo One has proposed fifteen 15 KHz channels operating at 9.6 kbps.

[16/] E-SAT Application at 28.

management of the corporate parent upon whom it is relying for financial resources." 47 C.F.R. § 25.140(d)(1). Despite this unambiguous requirement, E-SAT has failed to submit any evidence of financial ability or commitment, instead relying upon: (1) a letter from Charles Ergen, President of Echostar, assuring the Commission that E-SAT "has the financial capacity to invest to construct and operate" the proposed system; and (2) a letter from Fred Thompson, President of DBSI, assuring the Commission that E-SAT has the "financial capacity to invest to construct and operate an NVNG system."

Both of these corporate letters are devoid of any language of commitment and contain only a general expression of confidence in E-SAT's financial capacity. This is clearly not enough. DBSI has not submitted a balance sheet, so its support for the project is irrelevant in any event. Without the requisite evidence of commitment, the Echostar balance sheet is irrelevant and must be disregarded.

The Chief of the FCC's International Bureau recently elaborated upon the standard that a management commitment letter must meet in order to be considered evidence of financial qualifications under the domsat standard which is applicable here. The Bureau has expressly endorsed the management commitment letter from the National Exchange case[17/] as a model to be followed in assessing financial qualifications.[18/] In National Exchange, the corporate parent stated that it "intends to provide the necessary financial support for the satellite project." Similarly, in recently granting a NVNG MSS license to Orbcomm, the Commission found the company financially

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[17/] National Exchange Satellite, Inc., 3 FCC Rcd. 6992 (1988).

[18/] See Constellation Communications, Inc., DA 95-129, released January 31, 1995 at ¶ 12.

qualified where it demonstrated sufficient current assets and, in addition, "committed to making the necessary funds available" for the project.[19/] Neither the Echostar or DBSI letter contains any such language of support for the project. E-SAT's financial showing is therefore deficient under Commission precedent.

In short, E-SAT has failed to provide evidence of any internal or external financing that has been committed to the project. E-SAT's application is therefore defective and must be denied.

B. The E-SAT System Is Technically Flawed

As discussed below, and in the Technical Appendix, the E-SAT system is technically flawed. These technical flaws provide independent grounds for dismissal of E-SAT's application.

1. Signal Degradation

It has previously been pointed out in the NVNG MSS proceedings that spread spectrum techniques are unsuitable in the allocated frequency bands because of the unique nature of the sharing environment.[20/] CTA agrees with this analysis. The E-SAT system reflects the inherent flaws in the spread spectrum approach, which requires a reduction of data rates to comply with

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[19/] Orbital Communications Corporation, 9 FCC Rcd 6476, 6478 (1994).

[20/] Comments of Orbcomm on Starsys' Amended Application, filed June 20, 1994 at 2 and 9. See also id. at 2-5, Technical Appendix.

pertinent time and duty cycle limitations in the NVNG rules thereby resulting in severe degradation of the E-SAT signal to a point where subscribers will not receive a reliable service.

CTA's primary concerns are with the feasibility of the dynamic filtering techniques, minimal system operating margins and the immaturity of the CDMA technology for application in interference environments. With respect to the E-SAT system, the subscriber uplink presents a major problem and, according to CTA's calculations, will be unworkable. E-SAT has significantly underestimated the level of interference that will be experienced from terrestrial users in the 148 MHz band.

As detailed in the attached Technical Appendix (page 2), E-SAT's link budget is based on inaccurate assumptions about the level of terrestrial interference. Calculated accurately, the signal energy-to-noise ratio is equal to -10 to -15 dB. This is a very significant variation from E-SAT's calculations and indicates that the system degradation will be an extremely serious problem. With this level of degradation, the performance of the E-SAT uplink will not be adequate. In fact, under these interference conditions (as measured in Starsys and Orbcomm experiments) the E-SAT satellite will not receive a large percentage of messages from the subscriber terminals, and the message throughput will be extremely low.

Given the technical problems with the E-SAT system, and the likelihood that E-SAT will not be able to provide even a minimal level of service to the public, its application should be denied.

2. Inefficient Spectrum Use

E-SAT's proposal is highly inefficient, using more spectrum to provide a lower transmission rate than is achieved by FDMA systems. In the attached Technical Appendix, CTA demonstrates that FDMA systems will be six times more efficient than a CDMA system such as E-SAT proposes. Given the limited spectrum available, the highly inefficient E-SAT design should not be permitted.

3. Limited Service Capability

E-SAT's proposed use of a six-satellite design is also highly inefficient from a coverage standpoint. With six satellites, E-SAT will only be able to offer a limited service that would be available about four hours a day. E-SAT should not be permitted to tie-up the limited spectrum available with this inadequate system in the face of competing proposals that would provide near real-time service.

IV. GE AMERICOM HAS FAILED TO MEET THE APPLICABLE FINANCIAL STANDARD

The financial showing by GE Americom is also fatally defective and requires dismissal of the company's application. GE Americom estimates that the first two satellites in its proposed system will cost $13.8 million to construct, launch and operate for one year. Although GE Americom provides an Annual Report reflecting substantial assets, it has failed to submit a management commitment letter indicating that it is prepared to support the project. Instead, GE

Americom relies upon the fact that "the Commission has previously approved GE Americom's financial qualifications . . . based on a similar showing."[21/] This information does not meet the requirements of Rules 25.140 and 25.142. GE Americom's application is therefore defective and must be dismissed.

In lieu of a management commitment, GE Americom claims that its "qualifications to construct, launch, and operate a domestic fixed-satellite system are a matter of record before the Commission."[22/] In support of this proposition, GE Americom refers to the Commission's recent Order granting approval to transfer control of GTE Spacenet Corporation to GE Americom. This transfer proceeding, of course, is entirely different than the current NVNG MSS licensing proceeding. The Commission's review of financial qualifications and commitments in the context of a license assignment (where a buyer's financial qualifications are evidenced by ability to consummate the transaction) is far less stringent than a licensing proceeding. Where, as here, there are more applicants than can be accommodated in the available spectrum, a commitment by the applicant to fund the proposed system and to proceed expeditiously is critical.

In the Orbcomm Licensing Order, the Commission indicated that, even in the case of a wholly-owned subsidiary, a management commitment to the project is relevant to the financial qualifications of a NVNG MSS applicant.[23/] In finding Orbcomm to be financially qualified, the

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[21/] GE Americom Application at 6.

[22/] Id. at 7.

[23/] Orbcomm Licensing Order at 6478.

Commission pointed to the fact that Orbcomm had supplied a management commitment in addition to evidence of sufficient assets to fund the system.

Acceptance of the GE Americom approach would effectively allow a large company to pre-qualify on the basis of its name and reputation without having to demonstrate its commitment to a particular satellite project. The courts have explicitly rejected such an approach, and have cautioned the FCC about relying on the size and national reputation of an applicant in lieu of an appropriate financial showing. In Northeast Cellular Telephone Company v. Federal Communications Commission,[24] for example, the DC Circuit reversed a cellular license grant, where the Commission exempted the applicant from financial showings that other applicants were required to make. The Court rejected the Commission's reliance on the agency's familiarity with the applicant's financial backers stating: "Standing alone, this does not even begin to approach a standard for demonstrating that a licensee is 'indisputably financially qualified' and thus not required to provide a full statement of financial qualifications."[25]

The requirement of a management commitment is not a mere formality. The applicant must provide good faith evidence that it intends to proceed expeditiously with system development and implementation. A large company may have the financial wherewithal but no intention or management commitment to the project. Indeed, a company like GE Americom with many

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[24] 897 F.2d 1164 (D.C. Cir. 1990).

[25] Id. at 1167. The Court found that a license grant solely on the basis of the unique reputation and experience of the applicant's lender/partner amounted to an impermissible " we-know-it-when-we-see-it standard." Id.

other lines of business may be far less likely than a smaller company to proceed with the proposed business plan.[26/]

GE's reluctance to provide a management commitment, or even to indicate support for this satellite project, raises a serious question as to the company's willingness to proceed expeditiously with the project. Absent assurance that funds are committed and available to the project, as required by Commission Rules 25.140 and 25.142, the GE Americom application is defective and should be dismissed. At a minimum, the burden is on GE Americom to assure the Commission of its intention to proceed expeditiously with system implementation in order to ensure that other applicants, who are prepared to move forward, are given that chance.

V. ORBCOMM'S AMENDMENT MUST BE DENIED

On November 16, 1994, Orbcomm filed an amendment to its system application seeking to add additional satellites and frequencies.[27/] This amendment must be denied under long-standing Commission policy and rules requiring licensed satellite systems to provide detailed evidence of need for additional spectrum/orbital resources.

[26/] This was certainly the case in the 1985 Domsat proceeding where a number of large companies, including Federal Express and Martin Marietta, subsequently turned in their licenses to the Commission despite being financially qualified.

[27/] The filing of this amendment less than four weeks after Orbcomm's first-round application was granted on October 20, 1994, raises questions about the validity of the license. As has been previously pointed out, Orbcomm's licensing order provided an opportunity for Orbcomm to decline the authorization within 30 days. See Orbcomm Licensing Order at 6483. The filing of a major modification within 30 days of the licensing grant should be construed as a decision to decline the authorization by Orbcomm. See Petition for Reconsideration, filed by Final Analysis Communication Services, Inc., November 28, 1994.

In seeking to add six additional 15 KHz channels to its system, along with twelve additional satellites, Orbcomm's ostensible purpose is to expand coverage in the polar regions and to prevent intra-system interference within the Orbcomm system. It is apparent, however, that this objective could be accomplished without asking for twice as much spectrum (on an exclusive basis) as any of the other systems. As more fully discussed in the attached Technical Appendix, there are techniques available, including dynamic management of the system's downlinks, that would not require the extra channels requested.

Orbcomm has therefore not demonstrated any bona fide reason for the excessive amount of spectrum requested and its modification application should be denied. Denial of Orbcomm's application would also be consistent with long-standing Commission policies in the satellite field authorizing expansion satellites only when justified on the basis that existing facilities are essentially filled.[28/] Orbcomm has not argued, and cannot argue, that its recently-licensed system is already filled.

The public interest is best served by ensuring that the limited spectrum resources are assigned on the basis of "competitive considerations supporting new entry."[29/] "The public interest, convenience and necessity has been and continues to be well served by the competitive supply of diverse and innovative ... satellite service." [30/] Where, as here, there is significant

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[28/] See, e.g., 1985 Domsat Order at 1275. The Commission's "traditional policy" is to assign expansion locations only when in-orbit satellites are essentially filled and additional capacity is needed to acommodate traffic growth. Id. at 1277, ¶ 22.

[29/] Notice of Inquiry and Proposed Rulemaking, CC Docket No. 81-704, 88 F.C.C. 2d 318 (1981) at ¶ 24.

[30/] Id. at ¶ 12.

demand by new entrants and the licensed operator, Orbcomm, has not shown need for the additional spectrum requested, its application can and should be denied.

VI. THE COMMISSION SHOULD MOVE FORWARD QUICKLY TO RESOLVE THE ISSUE OF STARSYS' QUALIFICATIONS

In this proceeding, the Commission is confronted with the unique circumstance of processing second round applicants while the first round applications are still pending. The Commission should move forward rapidly to rule on the Starsys pending first-round application so that the amount of spectrum available for second round applicants, and the sharing considerations, will be clarified. At present, Starsys has an open-ended invitation from the Commission to try to pull together its financial showing.

On July 22, 1994, James Keegan, Chief of the Domestic Facilities Division, sent a letter to Starsys counsel granting an extension of time in which to make a financial qualification showing until 60 days after the release of a Commission action on Starsys' pending petition for declaratory ruling. That declaratory ruling seeks Commission concurrence that the Starsys ownership structure is compliant with Section 310. A fundamental assumption in the letter granting an extension is that "there will be no prejudice to existing and planned applicants" by the extension.

It is now apparent that the continuation of the Starsys extension is highly prejudicial to the second-round applicants. The Commission must move expeditiously to issue the requested declaratory ruling or to close the open-ended window that now exists for Starsys. Starsys'

inability to meet even the lenient financial test applicable to the NVNG MSS, more than 10 months after the deadline for doing so, raises serious questions about the company's financial ability. Serious technical questions have also been raised by Orbcomm (and in CTA's attached Technical Appendix) with respect to the company's highly inefficient technical design. Starsys should not be permitted to block new, qualified applicants that want to implement their business plans.

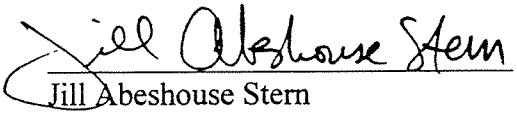
For these reasons, the Commission must take immediate steps to close the open-ended extension granted to Starsys and promptly require that company to meet the financial standards that other applicants must meet or forego licensing.

VII. CONCLUSION

For the foregoing reasons, the Commission should dismiss or deny the applications of Orbital Communications Corporation, Final Analysis Communications Services, Inc., GE American Communications, Inc., E-SAT, Inc., Leo One USA and Starsys Global Positioning, Inc.

Respectfully submitted,

CTA COMMERCIAL SYSTEMS, INC.

By: 

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Its Attorneys

I. Technical Deficiencies in Second Round Applications

A. CDMA Techniques

1. Inefficient Design

Since the NVGN systems are allocated in an interference prone portion of the spectrum due to earlier allocations, efficient operation of NVNG communications is essential. To highlight this issue, the spectral efficiency of FDMA and CDMA multiple access techniques for subscriber uplink using the 148 MHz band has been estimated. The result of this analysis shows that FDMA is a much more efficient technique than either the CDMA technique proposed by STARSYS or the hybrid CDMA/TDMA technique proposed by ESAT. Spectral efficiency is defined as the ratio of the system capacity (bps) to the bandwidth utilized (KHz). The metric provides an indication of the number of messages that a system can receive from subscribers normalized to the amount of spectrum allocated to the system. Since the service provided by a system is directly dependent on its message throughput, this metric essentially quantifies the level of service that a system can provide relative to the amount of spectrum that it uses.

This spectral efficiency is time dependent, but the long term averaging should be the same for both FDMA and CDMA. The results of this analysis comparing the CDMA techniques proposed by STARSYS and ESAT relative to GEMnet are presented in Table 1.

Parameter	STARSYS	ESAT	GEMnet
Bandwidth (KHz)	905	1000	2050
Satellites in View	1	1	2
Simultaneous Users	12	20	22
Uncoded Bit Rate (bps)	600	100	4800
Spectral Efficiency (bps per KHz)	8	2	52

Table 1: Comparison of Spectral Efficiency for Subscriber Uplink Channels

The spectral efficiency is derived as the ratio of the aggregate user bit rate to the allocated spectrum. The results in the table are based on CTA's interpretation of the data

provided by STARSYS and ESAT in their filings. However, after analyzing the ESAT filing, it became necessary to make an assumption on the number of simultaneous users. It is assumed that 20 users would be active in slot. While this assumption must be confirmed with ESAT, CTA believes that this is an optimistic assumption. If additional users were to be accommodated, the complexity of the satellite receiver would become impractical and expensive.

The conclusion of this analysis is that a single FDMA user (GEMnet) will be 6 times more efficient than either CDMA technique. Even if all of the applicants would use CDMA techniques, the spectral efficiency would be less than FDMA. Since the NVNG spectrum is very limited, it is clear that to achieve maximum utilization of the spectrum, FDMA access techniques or more efficient spread spectrum techniques should be used.

2. Link Performance and Interference

CTA shares ORBCOMM's concerns about the performance of the STARSYS system and has similar concerns about the performance of the ESAT system. The primary concerns are:

- feasibility of the dynamic filtering techniques,
- minimal system operating margins,
- immaturity of the CDMA technology for application in interference environments.

Based on these concerns, CTA believes that the STARSYS system will experience high error rates and a significant amount of service disruption that are unacceptable for a commercial service.

Relative to the ESAT system, CTA has identified the performance of the subscriber uplink channel as a major problem. CTA believes that ESAT has significantly underestimated the level of interference that will be experienced from external terrestrial users in the 148 MHz band. Based on the link budget presented their filing, ESAT estimated that the Eb/I_O' to be as much as 18 dB resulting in a degradation of only 0.3 dB in $Eb/(N_O + I_O + I_O')$ from 5.8 dB to 5.5 dB. This estimate does not accurately account for numerous CW carriers each with 20-30 dBw creating high levels of interference. This interference results in an $Eb/(N_O + I_O + I_O')$ equal to -10 to -15 dB. Overall the ESAT system is interference limited rather than thermal noise limited. With this level of degradation, the performance of the ESAT uplink error rate will be excessive and not inadequate for a commercial service.

B. ORBCOMM's FDM Downlink Channel Request

ORBCOMM has requested exclusive use of 6 additional 15 KHz downlink channels (for a total of 24) in the 137-138 MHz band to support the expansion of its constellation from 36 to 48 satellites. This expansion will fill out the two polar orbiting planes of its constellation from two to eight satellites. In addition, ORBCOMM has already been allocated a 50 KHz channel in this band for the downlink to its ground earth station. This new request will increase ORBCOMM's allocation in the 137 MHz band from 320 KHz to 410 KHz.

Currently, 1 MHz of bandwidth has been allocated to NVNG systems in this band. As a result, ORBCOMM's request for 410 KHz corresponds to 41% of the available bandwidth. However, meteorological systems are the primary user for 445 KHz of this band. Therefore, ORBCOMM is requesting 74% of the band that is available to NVNG systems on a primary basis.

The requests from all applicants for dedicated capacity are 1.085 MHz, far exceeding the bandwidth available on either a primary or secondary basis. ORBCOMM already has been allocated more bandwidth (320 KHz) than any other applicant has requested. In its amended filing of November 16, ORBCOMM bases its requests for additional bandwidth for its polar orbiting satellites on the need to prevent intra-system interference, i.e., between ORBCOMM satellites. CTA believes that ORBCOMM could develop more efficient access techniques to reduce its spectral needs. For example, the GEMnet constellation is nearly equal in size to the ORBCOMM constellation but requires only 225 KHz of bandwidth. GEMnet has a smaller bandwidth requirement because it employs a more efficient access scheme based on a dynamic allocation of downlink channels. ORBCOMM could employ a similar technique and operate within its existing bandwidth allocation. Another option available to ORBCOMM is to move its gateway to another band if more spectrum becomes available.

C. Failure to Accommodate Existing Terrestrial Users

Final Analysis Incorporated (FAI) and LEO One are proposing to operate subscriber uplinks at data rates that will cause existing terrestrial users increased interference. As specified in their filings, their requests for bandwidth are:

- Leo One - fifteen 15 KHz channels operating at 9.6 kbps
- FACS - fourteen 25 KHz channels operating at 9.6-19.2 kbps.

Both of these requests show poor RF engineering by not taking into account the design of the existing RF channel structure based on 25 KHz grids in the 148 MHz band. Rather than try to operate in the interstitial channels during busy periods, both LEO One and FAI will overlap with terrestrial user channels and cause interference. These basic concepts for RF engineering of NVNG systems are well known and documented in earlier filings available to both FAI and LEO One. Furthermore, the use of these wide bandwidth channels will degrade the performance of other NVNG systems that operate using the interstitial channels when necessary.

In order for FACS and Leo One to co-exist with other the terrestrial systems as well as other NVNG systems, it will be necessary for them to reduce their data rates to 4.8 kbps and channel bandwidth to 10 KHz. The analysis of the spectrum capacity and future estimate of future requirements is based on the assumption that the bandwidth requests from FACS and Leo One are correspondingly reduced to operate in 10 KHz channels.

II. Capacity of the Existing Spectrum Allocation

The commission has allocated the following spectrum for NVNG use:

- 148 - 149.9 MHz band - used for subscriber and gateway uplinks,
- 137.0 - 138.0 MHz band - used for subscriber and gateway downlinks,
- 400.15 - 401.0 MHz band - used for gateway downlinks.

It is expected that the 149.9 - 150.05 band, currently used by the DoD TRANSIT system, will be available for NVNG use in 1997. It will also be used for subscriber and gateway uplinks.

The use of these bands is constrained by the proposed operations in the use of these bands by the first round applicants, ORBCOMM, STARSYS, and VITA. In particular in the 148 MHz band, STARSYS plans to use a CDMA technique for subscriber access in the lower portion of the band and ORBCOMM and VITA plan to use FDMA techniques for subscriber access in the upper portion of the band.

The major constraint limiting allocation to additional applicants is the use of the allocated spectrum by other non-NVNG users. In the 148 MHz, the primary users are terrestrial users while in the 137 MHz and 400 MHz bands, meteorological satellites are primary users for major portions of the band.

The requests for spectrum by both first and second round applicants are summarized in Table 1 for 148 MHz usage, Table 2 for 137 MHz usage, and Table 3 for 400 MHz usage. Allocations to meteorological systems are also shown in these tables.

CTA estimates, at best, that one additional FDMA system can be accommodated assuming that:

- spectrum non-occupancy in the 149.0 - 149.9 MHz band is 0.35
- spectrum utilization of current users other than TRANSIT in the 149.9 - 150.05 MHz band is close to zero,
- limited timesharing of the 137 MHz and 400 MHz bands among meteorological systems and NVNG systems is permitted.

The estimate of one additional FDMA system is preliminary based on the above assumptions. It is very unlikely that more than can one system can be accommodated because of the constraints in the 148 MHz band. Even if the spectrum non-occupancy was higher in the 148 MHz band, there would not be enough spectrum for the additional gateway uplinks or subscriber downlinks.

As described above, CTA has major concerns about the operation of the CDMA systems that have already been proposed. Therefore, accommodation of additional CDMA systems is a moot issue. One FDMA system could be accommodated in the lower portion for subscriber uplinks and the STARSYS allocation for gateways in the 148 MHz band. However, this would require additional sharing with the meteorological systems and not permit allocation of additional 137 MHz spectrum to ORBCOMM for its downlinks. While one more FDMA system (total of 2) might be accommodated in the lower portion of the band, it is unlikely that its gateway uplinks and subscriber downlinks could be accommodated within the existing spectrum allocations.

In summary, it is estimated that the one additional FDMA system could be accommodated using the upper portion of the 148 MHz band and one additional FDMA system could be accommodated using the STARSYS spectrum allocation. Thus, the need for additional spectrum is essential.

III. Requests for Additional Information

The efficient use of the spectrum requires detailed analysis of the current use of the spectrum especially the 148 MHz band. Also, to accurately interpret the claims made by STARSYS and ORBCOMM, it is essential that they share their measurement data with the commission and other applicants. This will enable all parties to work together to develop the most efficient spectrum utilization techniques and to provide the best service to the user community.

	FDMA Shared	Dedicated	CDMA Shared
	KHz	KHz	KHz
GEMnet	220	50	
ORBCOMM	120	50	
FAI	280	50	
GE Americom	204	72	
LEO One	300	50	
VITA	90		
STARSYS		50	950
ESAT			1000
	1214	372	1000

Table 1: Summary of 148 MHz Requirements

System	Dedicated FDMA	Shared CDMA	Other Users
	KHz	KHz	KHz
GEMnet	225		
LEO One	200		
ORBCOMM	410		
FAI	225		
STARSYS	25	1000	
ESAT		1000	
Meteorological			445
Total	1085	1000	445

Table 2: Summary of 137 MHz Requests

	Dedicated	Other Users
	KHz	KHz
GEMnet	180	
ORBCOMM-beacon	50	
VITA	90	
FAI	200	
GE Americom	146	
LEO One	180	
STARSYS	50	
Meteorological		710
	896	710

Table 3: Summary of 400 MHz Requests

Declaration

I, Regan E. Howard, hereby certify under penalty of perjury that the following statements are true and correct to the best of my knowledge and belief:

1. I am employed by CTA Commercial Systems, Inc. as Chief Engineer.

2. I am the technically qualified person responsible for preparation of the engineering information and analysis contained in the foregoing "Consolidated Petition to Deny", including the Technical Appendix.

3. All of the engineering information and analysis contained in the foregoing document is correct to the best of my knowledge, information, and belief.

Regan E. Howard

Dated: 2/23/95

Regan E. Howard
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CERTIFICATE OF SERVICE

I, Felecia G. DeLoatch, do hereby certify that a true and correct copy of the foregoing document was sent by first-class mail, postage prepaid, or hand-delivered, on this 24th day of February, 1995, to the following persons:

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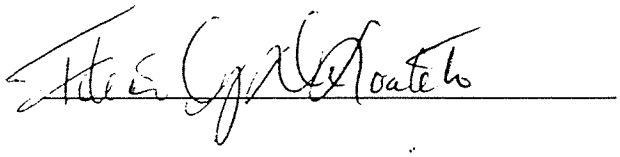

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