Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of	)		
	)		
FINAL ANALYSIS	)		
COMMUNICATIONS SERVICES, INC.	)	File Nos.	25-SAT-P/LA-95
	)		76-SAT-AMEND-95
For Authorization to Construct, Launch	)		79-SAT-AMEND-96
and Operate a Non-Voice,	)		151-SAT-AMEND-96
Non-Geostationary Mobile Satellite	)		7-SAT-AMEND-98
System in the 148-150.05 MHz,	)		
400.15-401 MHz, and 137-138 MHz bands	)	Call Sign	S 2150

MEMORANDUM OPINION AND ORDER

Adopted: November 20, 2001 **Released: December 3, 2001**

By the Commission:

I. INTRODUCTION

1. With this Order, we consider the Application for Clarification and Review filed by Final Analysis Communication Services, Inc. ("Final Analysis"), and the Application for Review filed by Leo One USA Corporation ("Leo One"), both of which ask us to review the International Bureau Order licensing the Final Analysis satellite system.[1] As part of the second processing round for applicants seeking authority to launch and operate non-voice, non-geostationary mobile satellite service systems in low Earth orbit ("NVNG MSS" or "Little LEO" systems), the Bureau authorized Final Analysis to construct, launch and operate a 26-satellite Little LEO system. The Bureau denied, however, a number of amendments that Final Analysis sought to make to its application. We affirm the Bureau's decision that many of Final Analysis's amendments were not necessary to conform to the Commission's rules for second processing round Little LEO systems. We also affirm the Bureau's decision that most of Final Analysis's non-conforming amendments were major amendments and as such, they could not be considered in the processing round. We grant two portions of Final Analysis's Application for Clarification and Review, reversing the Bureau's denial of the request to increase the number of on-orbit spare satellites, and the request to increase downlink power in the 137-138 MHz band. We dismiss as moot the Leo One Application for Review.

II. BACKGROUND

A. Second Little LEO Processing Round

2. In October 1993, Leo One filed an application for a Little LEO system. At the time it filed its application, the Commission was considering Little LEO applications previously filed and being considered concurrently in the first Little LEO processing round. The Commission placed Leo One's

[1] Final Analysis Communications Services, Inc., Application for Clarification and Review (filed May 1, 1998) ("Application for Review"); Leo One USA Corporation, Application for Review (filed May 1, 1998); *Final Analysis Communication Services, Inc.*, Order and Authorization, DA 98-616, 13 FCC Rcd. 6618 (Int'l Bur. 1998) ("*License Order*").

application on public notice in September 1994. In the Public Notice, the Commission established a cut-off date by which other applicants would have to file in order to be considered concurrently with Leo One's application.[2] This Public Notice commenced the second Little LEO processing round (the "Second Round"). On the specified cut-off date, Final Analysis submitted an application requesting authority to construct and operate a global Little LEO system consisting of 26 satellites operating in the 148-150 MHz frequency band for Earth-to-space transmissions, and the 137-138 MHz frequency band for space-to-Earth transmissions.[3]

3. The second processing round included eight applicants. In addition to Leo One and Final Analysis, the Second Round applicants were CTA Commercial Systems, Inc. ("CTA"), E-SAT, Inc. ("E-SAT"), and GE American Communications, Inc. ("GE Americom"). Orbital Communications Corporation ("Orbcomm") and Volunteers In Technical Assistance, Inc. ("VITA"), both first Little LEO processing round ("First Round") applicants, also filed applications in the Second Round to modify their First Round systems. Additionally, Starsys Global Positioning, Inc. had previously filed a major amendment to its First Round application, which the Bureau deferred for consideration in the Second Round.[4]

4. The Second Round applicants proposed to operate in spectrum allocated to the NVNG MSS in the 137-138 MHz, 148-150.05 MHz, and 400.15-401 MHz frequency bands.[5] All of these frequency bands are shared with other Little LEO systems, and government systems in the United States, and with terrestrial systems. Further, the NVNG MSS allocation in portions of the 137-138 MHz band is on a secondary basis only with respect to non-Little LEO satellite services.[6]

5. Unlike the First Round, in which sufficient spectrum existed to accommodate the three applicants, there was not enough spectrum available to accommodate all eight systems proposed by the Second Round applicants. Portions of the available uplink and downlink spectrum had already been licensed to First Round applicants Orbcomm, Starsys and VITA. Available downlink frequency bands were also shared on a primary or secondary basis with two government users, the National Oceanic and

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[2] *Satellite Application Acceptable for Filing; Cut-Off Established For Additional Applications*, Public Notice Report No. DS-1459, 9 FCC Rcd 5261 (1994).

[3] Final Analysis Communication Services, Inc., Application to Construct, Launch and Operate the Final Analysis Low-Earth Orbit Satellite System (filed Nov. 16, 1994). The complete application consists of that original application and amendments filed on February 24, 1995, February 23, 1996, August 19, 1996 and October 30, 1997 (all, collectively, the "Application").

[4] *See Application of Starsys for Authority to Construct, Launch, and Operate a Non-Voice, Non-Geostationary Mobile Satellite System*, Order and Authorization, 11 FCC Rcd 1237, ¶¶ 19 and 21 (1995).

[5] *See* 47 C.F.R. § 2.106. Although the Final Analysis Application did not initially propose operation in the 400.15-401 MHz frequency band, the Application was later amended to reflect the frequency bands designated for the Final Analysis system in the joint agreement among the applicants.

[6] *See Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service*, Report and Order, FCC 97-370, 13 FCC Rcd 9111, 9140 n.112 (1997) ("*Report and Order*"). A service designated as secondary may operate in a particular band only to the extent that it does not cause harmful interference to any primary or co-primary designated service. *See* 47 C.F.R. § 2.105(c)(3). *See also* International Telecommunication Union Radio Regulations, Edition of 1998, Article S5, Section II -- Categories of services and allocations, S5.28 through S5.31 ("Stations of a secondary service: a) shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date; b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date; c) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date").

Atmospheric Administration ("NOAA") and the Department of Defense ("DOD"). Our notice of proposed rulemaking for the Second Round took into account all of these constraints on available spectrum.[7]

6. The *Second Round Notice* proposed to: (a) exclude First Round licensees from participating in the Second Round, in order to increase competition among Little LEO providers; (b) license up to three new Little LEO systems; (c) establish procedures that would require Second Round Little LEO Systems to protect the NOAA and DOD government satellite systems; and (d) use auctions to resolve mutual exclusivity among Second Round applicants. Subsequently, Starsys and GE Americom withdrew their applications, and Orbital Sciences Corporation, Orbcomm's parent, acquired the satellite operations of CTA.[8]

7. After the Commission issued the *Second Round Notice*, the remaining Second Round applicants reached a spectrum sharing plan that could accommodate them all in the available spectrum, using certain transmission techniques, system coordination, and time-sharing of certain frequencies.[9] The parties asked the Commission to adopt this Joint Proposal and to award each applicant a license. Specifically, the parties asked the Commission to authorize three new Little LEO systems, assigning new System 1 to Leo One in the 148-150.05 MHz (uplink) band and the 137-137.025 MHz, 400.15-400.505 MHz and 400.645-401 MHz (downlink) bands, using Frequency Division Multiple Access ("FDMA") and Time Division Multiple Access ("TDMA") transmission techniques. System 2 would be assigned to Final Analysis in the 148-150.05 MHz (uplink) and the 400.15-401 MHz and 137-138 (downlink) bands using FDMA/TDMA transmission techniques. System 3 would be assigned to E-SAT in the 148-148.905 MHz (uplink) and the 137.0725—137.9275 MHz (downlink) bands using Code Division Multiple Access ("CDMA") transmission techniques. The Joint Proposal further provided that Orbcomm and VITA would continue to operate their modified systems using FDMA and TDMA transmission techniques. As is explained in the discussion of sharing techniques below, this difference in transmission techniques for System 3 allows E-SAT to share certain frequencies with an FDMA/TDMA system when two FDMA/TDMA systems could not simultaneously operate in that spectrum.

8. The Joint Proposal also required the applicants to share the Little LEO spectrum with NOAA and DOD, with terrestrial U.S. users of the band, and with certain foreign-licensed satellite systems, including a proposed French satellite system (S80-1), the Russian radionavigation satellite service system, and the proposed Russian METEOR satellite system. The Joint Proposal also provided that the Little LEO applicants would share portions of the Little LEO spectrum among themselves, including that Final Analysis, Leo One, Orbcomm and E-SAT would share the 148-150 MHz uplink band frequencies.

9. In order for the Commission to implement the proposed sharing plan, the applicants agreed to amend their pending Little LEO applications in a manner consistent with the Joint Proposal and with Commission rules.[10] The applicants also agreed to withdraw their pending petitions or objections against each other's applications, and waived their right to appeal our order implementing rules for the Second Round so long as it was consistent with the Joint Proposal. In filing the Joint Proposal with the Commission, the Second Round applicants represented to the Commission that the spectrum sharing

[7] *Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service*, Notice of Proposed Rulemaking, 11 FCC Rcd. 19841 (1996) (the "*Second Round Notice*").

[8] *See Report and Order*, 13 FCC Rcd at 9116 ¶ 10.

[9] Joint Proposal of E-SAT, Inc., Final Analysis Communication Services, Inc., Leo One USA Corporation, Orbital Communications Corporation, and Volunteers in Technical Assistance (filed Sept. 22, 1997) ("Joint Proposal").

[10] Joint Proposal at 9.

approach described in the Joint Proposal would provide a manageable spectrum environment.[11] Our *Report and Order* and the Bureau's five licensing orders accepted that representation and essentially adopted the applicants' Joint Proposal.

10. The Commission issued the *Report and Order* on October 15, 1997, based on those representations, concluding that with certain transmission techniques, system coordination, and time-sharing of frequencies contemplated in the Joint Proposal, there was sufficient spectrum available to accommodate the five Second Round applicants.[12] Because the ability to accommodate the three new and two modified Little LEO systems was, in large measure, based upon the specific system parameters to which the applicants agreed in the Joint Proposal, the Commission provided the applicants an opportunity to amend their applications to bring them into conformance with the Joint Proposal and the rules and policies adopted in the *Report and Order*. The Commission indicated in that order that only amendments necessary to bring an application into conformance with the Joint Proposal and the policies adopted in the *Report and Order* would be accepted unconditionally.[13] The Commission emphasized that all other amendments would be considered under the Commission's rule governing amendments for satellite systems. Specifically, Section 25.116(c) of the Commission's rules provides that any application will be deemed a newly filed application to be considered in a later processing group if it is amended by a "major amendment."[14] A "major amendment" is an amendment that increases the potential for interference.[15] None of the applicants, including Final Analysis, appealed this decision.

B. Final Analysis Amendment

11. Final Analysis filed an amendment to its pending Application on the deadline set by the *Report and Order*.[16] As agreed in the applicants' Joint Proposal, Final Analysis's Amendment proposed operation on the frequency bands assigned to System 2 in the *Report and Order*. Those frequencies are the 148-150.05 MHz uplink and 137.0-138.0 MHz and 400.15-401.0 MHz downlink bands. The Bureau analyzed Final Analysis's proposed operations in those uplink and downlink frequency bands, and found that the Amendment proposal to operate in System 2 spectrum conformed to the Joint Proposal.[17]

12. The Amendment, however, also proposed to modify various technical aspects of Final Analysis' proposed system. These included: an increase in the number of operational satellites from 26 to 32; an increase in the number of non-operational in-orbit spare satellites, from four to six; a shift in the inclination of the satellites' orbital planes from 66° to 51°; an increase in the number of orbital planes from four to six planes; a decrease in the number of operational satellites in each orbital plane, from six to five; an increase in the uplink power from 10W to 20W; and an increase in the downlink power from 12.8 dBW to 17.8 dBW. The Amendment also appeared to request authority to operate at higher data rates, to operate its uplink transmissions by a message terminal polling method, and to increase its feeder and subscriber uplinks and downlinks. In support of its Amendment, Final Analysis argued that the system amendments it requested were, as a whole, "demonstrably necessitated" by the time-sharing requirements

[11] Joint Proposal at 2.

[12] *Report and Order*, 13 FCC Rcd. at 9122 ¶ 25.

[13] *Report and Order*, 13 FCC Rcd. at 9161 ¶ 131.

[14] 47 C.F.R. § 25.116(c).

[15] 47 C.F.R. § 25.116(b)(1). The rule specifies other causes for a change to be deemed a "major amendment," but those causes do not apply in this case.

[16] Amendment to Application of Final Analysis Communication Services, Inc. for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System, File No. 25-SAT-P/LA-95 (filed October 30, 1997) ("Amendment").

[17] *License Order*, 13 FCC Rcd. at 6625-35.

in the *Report and Order* and by its need to maximize the availability of its system.[18] Leo One filed a petition to deny and Orbcomm filed comments opposing Final Analysis' Amendment.[19] In its petition to deny, Leo One argued that Final Analysis' Amendment as a whole constituted a major amendment filed after the cut-off date, requiring us to defer consideration of Final Analysis' entire application until another processing round.[20]

13. The Bureau found that most of Final Analysis's proposed changes were not necessary to conform to the *Report and Order*. The Bureau analyzed the non-conforming changes under the Commission's major amendments rule. It found that Final Analysis's proposed changes to its constellation design, and increases in both uplink and downlink power increased the potential for interference with other Little LEO applicants and with government users sharing the same frequency bands.[21] The Bureau also rejected Final Analysis's claim that the Commission should grant the amended application because it was necessitated by the requirements adopted in the *Report and Order*.[22] Final Analysis argued that the time-sharing constraints imposed in the *Report and Order* would preclude it from implementing a competitive system offering near real-time service. The Bureau found, however, that nothing in the *Report and Order* allowed Final Analysis to modify its constellation design in a manner that would affect the other Little LEO systems.

14. Thus, the Bureau granted a license to Final Analysis that authorized those portions of its Application and its Amendment that conformed to the *Report and Order* and to the parties' Joint Proposal, rather than defer Final Analysis's application to a future processing round.[23]

C. Application for Review

15. In its Application for Review, Final Analysis asks the Commission to reverse the Bureau's *License Order* by granting the Amendment in its entirety. The Application for Review contends that the *License Order* contains errors of fact and errors of law that lead to unreasonable and unsupported determinations on the major amendment status of its proposals.[24] Final Analysis also contends that without authorization of all its proposed amendments, it will be compelled to decline the license as authorized in the *License Order*, an action it claims will result in the invalidation of the applicants' Joint Proposal and will undermine the entire Little LEO industry.[25] Both Orbcomm and Leo One filed comments opposing the Application for Review.[26]

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[18] Amendment at 3-6 (citing 47 C.F.R. § 25.116(c)(4)).

[19] Leo One Petition to Deny the Amendment (filed Dec. 4, 1997); Comments of Orbcomm on the Amendment (filed Dec. 4, 1997).

[20] Leo One Petition to Deny at 3, citing 47 C.F.R. § 25.116(c).

[21] *License Order*, 13 FCC Rcd. at 6635-6642.

[22] *Id.* at 6636.

[23] *License Order*, 13 FCC Rcd. at 6647 ¶ 82.

[24] Application for Review at 2-3.

[25] *Id.* at 3. A little over a month after Final Analysis was issued a Little LEO license, the Bureau issued an Order denying Final Analysis's request to toll or stay a condition in its license requiring it to certify that it would accept the license and proceed to construct the system as licensed. Final Analysis maintained that this certification requirement foreclosed its ability to seek administrative and judicial review of the *License Order*. The request was opposed by Leo One. The International Bureau explained that the certification requirement was necessary to allow all five licensed systems to proceed with technical coordination based upon the technical parameters of the Second Round licenses, and that coordination among the Little LEO licensees would be significantly hampered, delaying implementation of other Little LEO systems and service to the public. *Certification Order*, 13 FCC Rcd. 12329, (continued....)

16. In this Order, we first review the International Bureau's decision that the amendments at issue here were not necessary to conform to the *Report and Order*. If we affirm that decision, we will then review the Bureau's determinations as to whether each proposed change results in an increased potential for interference, and thus constitutes a major amendment that cannot be considered in the Second Round.

III. DISCUSSION

A. Conforming Amendments

17. The first argument that Final Analysis makes in support of its Application for Review is that the International Bureau erred in concluding that the proposals in its Amendment were not required to conform to the *Report and Order*. Whenever the Commission develops satellite service rules concurrently with consideration of pending applications for that service, as it did in the second Little LEO processing round, we always allow applicants an opportunity to amend their pending applications to bring them into conformance with the rules that we adopt for the particular service.[27] Because most service rules are based upon service-specific technical requirements designed to accommodate as many satellite systems as possible in the available spectrum, technical changes beyond those required by the rules could impact the operations of other proposed systems. Consequently, the Commission has always limited conforming amendments to changes made necessary by the newly adopted service rules.[28] The *Report and Order* describes acceptable conforming amendments. In fact, an example described in the *Report and Order* is one type of change proposed by Final Analysis, i.e., a change in the feeder or service link spectrum to meet requirements imposed by the spectrum sharing plan that we adopted in the *Report and Order*.[29] Further, the *Report and Order* provided an example of an unacceptable amendment, a "change from a CDMA to a FDMA/TDMA transmission technique."[30]

18. The Amendment that Final Analysis filed proposed changes far beyond anything necessary to conform to service rules. We agree with the Bureau's finding that these proposed changes to Final Analysis's constellation design and proposed increases in both uplink and downlink power were not necessary to bring its proposed system into compliance with the rules. We disagree with Final Analysis

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12331 (Int'l Bur., 1998). On May 15, 1998, the deadline set forth in the *Certification Order*, Final Analysis filed a letter certifying its intent to build the Little LEO system as authorized in its license. Final Analysis also filed a Petition for Reconsideration of the certification requirement on May 14, 1998. We find that the substance of Final Analysis's argument in that Petition for Reconsideration is also raised in its Application for Review and is decided in this Order. We therefore dismiss the Petition for Reconsideration as moot.

[26] Opposition of Leo One USA Corporation (filed May. 18, 1998); Comments of Orbcomm on the Application for Review (filed May 18, 1998).

[27] *See Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile-Satellite Service*, Report and Order, 8 FCC Rcd. 8450, 8457 ("*First Round Little LEO Order*"); *see also 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*, Report and Order, 9 FCC Rcd. 5936, 5961 (1994) ("*Big LEO Order*").

[28] In the *First Round Little LEO Order*, for example, we stated that conforming amendments would be accepted to the extent that they were made necessary by requirements the Commission imposed after the First Round cut-off date. *First Round Little LEO Order*, 8 FCC Rcd at 8457, ¶ 26. Similarly, in the *Big LEO Order*, we stated that a conforming amendment proposing a change not made necessary to bring an application into conformance with our rules, and which would increase frequency conflicts, would render the application a newly filed application to be considered in a future processing group. *Big LEO Order*, 9 FCC Rcd. at 5961 ¶ 59.

[29] *Report and Order*, 13 FCC Rcd. at 9161 ¶131.

[30] *Report and Order*, 13 FCC Rcd. at 9161.

that the *Report and Order* merely adopted a frequency plan, leaving all other implementing details to the applicants. We find that the Joint Proposal is not simply a frequency plan, but an agreement to operate in the assigned spectrum that is based upon the applicants' system designs as they existed at that time. Final Analysis claims that factors of timesharing, altered frequency assignments, and anticipation of future spectrum assignment made the system design changes in its Amendment necessary.[31] None of these factors supports the proposed changes as necessary to conform to the *Report and Order*. Timesharing of frequencies was a concept central to system implementation from the inception of the Second Round. Final Analysis's frequency assignments were made, in significant part, due to its designation as System 2 under the Joint Proposal. Similarly, any expectation of future spectrum allocations for the Little LEO service was designated for System 2 only in the *Report and Order* and the Joint Proposal. This use of future spectrum was restricted to a System 2 priority to apply for and use a limited amount of downlink spectrum, should such spectrum become available in the future.[32] To this extent, the System 2 license authorized to Final Analysis recognizes this use of future spectrum. We affirm the Bureau's finding that many changes proposed by Final Analysis were not conforming amendments. Consequently, we analyze each non-conforming change in turn to determine whether it constitutes a major amendment under our rules.

19. Final Analysis also argues that it was compelled to accept unforeseen and severely limiting design constraints to its system, an argument that appears to undermine the validity of the Joint Proposal.[33] As with any agreement among competing parties, we expect that tradeoffs are made in the spirit of compromise. In other words, each party gained something and gave up something. The Commission implemented the final agreement among the parties, as it did when it licensed the First Round applicants in 1994 and 1995. We use the conforming amendment process to allow applicants to come into compliance with system-wide changes imposed by service rules. The process is not intended to allow applicants to make themselves "whole" with a system that was not "on the table" when the applicants reached an agreement – an agreement that accommodated them all and that permitted the Commission to license the Second Round Little LEO systems without having to adopt a selection mechanism to choose among mutually exclusive applications. We therefore reject Final Analysis's argument that the *License Order* imposed upon it was "an unworkable regulatory hybrid design."[34]

B. Major Amendments Analysis

20. Section 25.116 of the Commission's Rules permits applicants to amend pending satellite applications unless the change constitutes a "major" amendment made after a "cut-off" date.[35] The rule specifies that amendments that increase the *potential* for interference are major amendments.[36] The Bureau found that Final Analysis's proposed constellation changes and its proposed increase in power were major amendments. We uphold the Bureau's findings, except as noted herein.

1. Constellation Design Changes

21. Final Analysis proposed to increase the number of operational satellites from 26 to 32, and to increase the number of inactive on-orbit spare satellites from four to six. Final Analysis also proposed to decrease the number of operational satellites in each orbital plane from six to five satellites, to increase

[31] Application for Review at 8.

[32] *Report and Order*, 13 FCC Rcd. at 9126 ¶ 26.

[33] Application for Review at 3.

[34] Application for Review at 5.

[35] 47 C.F.R. § 25.116.

[36] 47 C.F.R. § 25.116(c)(1).

the number of orbital planes from four to six evenly spaced orbital planes, and to decrease the orbital inclination from 66 to 51 degrees.[37] Final Analysis argued that the changes are needed to compensate for the constraints on its operations resulting from time-sharing requirements with NOAA. The Bureau denied these changes because it found that they increased the potential for interference to other systems sharing the downlink bands.[38]

22. We review the Bureau's decision on Final Analysis's proposed constellation design changes by analyzing the proposals' impact on both the downlink and uplink bands. While Final Analysis proposes a host of changes to its constellation, its most significant change involves an increase in the number of satellites without an offsetting proposal to diminish the capacity of the satellites. Our review, and the Bureau's analysis, therefore focuses on the impact of additional identical satellites on the shared downlink and uplink bands. We note, however, that Final Analysis's other proposed constellation design changes -- to increase the number of orbital planes and to decrease their orbital inclination angle – also result in increased coverage to certain areas on the Earth. Final Analysis acknowledges that there will be an increase in its coverage for areas below 50 degrees north latitude, which includes most of the continental United States.[39] This increase in coverage, by itself, amounts to an increase in the potential for interference in these areas to other Little LEO systems.

a. Downlink Band Impact

23. Final Analysis's 137-138 MHz and 400.15-401.0 MHz downlink bands are principally time-shared with NOAA. E-SAT and Final Analysis also share several sub-segments in the 137-138 MHz band. VITA also shares downlinks with Final Analysis in two small segments of spectrum in the 400.15-401.0 MHz band.[40] With respect to time-sharing the spectrum in the 137-138 MHz frequency band with NOAA, our rules require Final Analysis's satellites to cease transmitting before their satellite transmission beams (each also referred to as a "footprint") overlap the NOAA satellite's comparable beam on Earth (NOAA's "protection area").[41] Interference, which in this instance is called a "time-sharing violation," occurs when a Final Analysis satellite fails to cease co-frequency transmissions during the period in which Final Analysis's footprint and NOAA's protection area overlap. Time-sharing violations may be caused by numerous factors including an on-board failure, ground control errors, and other anomalies.

24. Final Analysis argues that the changes in its constellation design will not create greater potential for interference NOAA in the downlink bands.[42] Final Analysis argues that two conditions must be present before the addition of satellites can create a greater potential for interference to NOAA: (i) a greater number of footprint overlaps are created between the Final Analysis and NOAA systems, and (ii) the overlapping satellites transmit at the same time on the same frequency.[43] The probability of these two conditions occurring is very low, according to Final Analysis.

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[37] Final Analysis Amendment at 8-11.

[38] *License Order*, 13 FCC Rcd. at 6636 ¶¶ 49-50.

[39] *See* Final Analysis Communication Services, Inc., Opposition To Petition To Deny, File Nos. 7-SAT-AMEND-98; 25-SAT-P/LA-95 at 12 (filed December 15, 1997).

[40] Neither E-SAT nor VITA commented upon Final Analysis's proposed constellation changes. Although we might assume from their silence that Final Analysis' proposed changes do not increase potential interference to their Little LEO systems in shared downlink bands, our analysis of the changes' effect on NOAA alone drives our decision to deny them.

[41] 47 C.F.R. § 25.259(a).

[42] Application for Review at 9.

[43] Application for Review at 9.

25. The Commission and NTIA share jurisdiction to administer the frequencies in which the Commission's commercial Little LEO licensees operate in the spectrum simultaneously occupied by government users. In fact, in portions of the 137-138 MHz downlink bands, the Little LEO service operates under a secondary allocation, which means that Little LEO services cannot cause interference to primary government operations in the band. The Commission formally requested NTIA (on behalf of NOAA, the affected government user) to provide final agency views on whether Final Analysis's proposed constellation design changes increase the potential for interference to government systems in the shared bands.[44] NTIA concluded that in the 137-138 MHz band "there is an increased potential for interference under failure conditions between the application granted by the International Bureau and that proposed in the modified design."[45]

26. Given NTIA's concern about the potential for increased interference to primary government operations, we uphold the Bureau's findings that Final Analysis's proposed constellation changes were major amendments. We also find that Final Analysis's argument that the probability of interference is low is based upon its erroneous assumption that a major amendment is one that increases actual interference, rather than the *potential* for interference. Each Final Analysis satellite has the potential to cause a timesharing violation. Therefore, an increase in the number of Final Analysis satellites increases the potential number of such violations. Even if we accept Final Analysis's assertion that the proposed change will not increase the overall number of Final Analysis-NOAA footprint overlaps in operation, we cannot agree that a nearly 23% increase in the number of satellites (from 26 to 32) would not raise the overall potential of timesharing violations.[46]

27. We also recognize NTIA's suggestion that the added potential for interference could be offset by measures that Final Analysis can take to monitor and control its satellites effectively.[47] NTIA stated that it would not object to the Commission granting the proposed constellation design changes, provided that Final Analysis's license includes a requirement to correct time-sharing violation failures within four hours.[48] Final Analysis vigorously opposes this suggestion for a monitoring condition on its license.[49] We appreciate that NTIA made this proposal in the spirit of compromise, as a measure to offset the increase in potential for interference that would arise from Final Analysis's constellation design

[44] Letter from Thomas S. Tycz, Chief, Satellite and Radiocommunication Division, FCC, to William T. Hatch, Acting Associate Administrator, NTIA (Oct. 27, 1998). The specific questions posed to NTIA were: "1. Do Final Analysis's proposed changes to its constellation design increase the potential for interference to government systems in the 137-138 MHz band, in the 148-150.05 MHz band, and/or in the 400.15-401 MHz band? 2. Does the proposed change in downlink equivalent isotropically radiated power (EIRP) or the proposed change in uplink EIRP increase the potential for interference with government systems? 3. Taking into account the responses to the above questions, would the Final Analysis system, as modified by the conforming amendment, necessitate any additional operational parameters?"

[45] Letter from William T. Hatch, Acting Associate Administrator, NTIA, to Thomas S. Tycz, Chief, FCC Satellite Radiocommunication Division (Dec. 11, 1998) ("NTIA Letter"). NTIA also concluded, in response to the second question, that there is some potential for increased out-of-band interference to government users in the 400.155-401.00 MHz band, but it should not be an insurmountable problem.

[46] An increase in time sharing violations is tantamount to an increase in the potential for interference.

[47] NTIA Letter at 3-4.

[48] *Id.*

[49] Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Regina Keeney, Chief, FCC International Bureau (Dec. 24, 1998); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Roderick K. Porter, Acting Chief, FCC International Bureau (June 15, 1999); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Donald Abelson, Chief, FCC International Bureau (Nov. 16, 1999).

changes.[50] Nevertheless, because Final Analysis has not agreed to a monitoring condition, we will not impose one. We consequently find that the Final Analysis constellation design changes will increase the potential for interference to NOAA in the downlink bands.

28. In addition, Final Analysis argues that the First Round decision allowing Orbcomm to increase the number of satellites in its system and to lower their orbital altitude, requires us to treat Final Analysis's proposed changes to its constellation design similarly to Orbcomm's application and amendment in the First Round. The Commission determined in that decision that an increase in the number of satellites can increase the total aggregate downlink power and increase potential intersystem interference.[51] But Orbcomm's First Round request was authorized after it executed a settlement agreement with the only other Little LEO applicant sharing its downlink spectrum at that time.[52] In accordance with that agreement, Orbcomm conceded to power down its transmission to minimize interference into the other system. There is no such sharing agreement in this round to allow Final Analysis's constellation design changes. Quite the contrary, there is a sharing agreement, the Joint Proposal, for the constellation design to which the Bureau restricted Final Analysis.

29. On the overall issue of the effect of constellation design changes on shared downlink bands, we affirm the Bureau's finding, based upon NTIA's conclusion, that Final Analysis's proposed constellation design changes increase the potential for interference to NOAA satellite systems in the 137-138 MHz band.[53] This finding alone requires that the constellation design changes be denied as a major amendment.

b. Uplink Band Impact

30. Final Analysis is authorized to share the Little LEO uplink frequency band at 148-149.9 MHz with three other Little LEO systems – E-SAT, Leo One, and Orbcomm – as well as with terrestrial systems also operating in the band.[54] Final Analysis is required to avoid causing harmful interference to both the Little LEO and terrestrial systems. To ensure interference-free operation in the uplink band, Final Analysis's Amendment proposed to implement a scanning activity receiver system ("STARS").[55] STARS is an enhanced version of a dynamic channel activity assignment system ("DCAAS") technique Leo One and Orbcomm proposed to implement. DCAAS is based on a scanning on-board satellite receiver capable of periodically (every 5 seconds, for example) measuring the interference power across the entire band, in search for clear uplink channels (that is, those with the least amount of interference). Once these uplink channels are identified, the satellite directs the subscriber on the ground to transmit on the specified channel frequency. The advantage of DCAAS is that it simultaneously allows these FDMA/TDMA Little LEO systems to avoid causing harmful interference to the terrestrial systems while sharing the same uplink spectrum with other Little LEO systems.

31. The Bureau found that Final Analysis's proposal to increase the number of satellites in its constellation could result in increased demand for or use of the limited number of available DCAAS channels in the 148-149.9 MHz band, reducing the amount of spectrum available to provide channels for the other DCAAS systems, notably Leo One and Orbcomm. The Bureau found that this potential

[50] NTIA Letter at 4 (Dec. 11 1998).

[51] *Orbital Communications Corporation*, Order and Authorization, 9 FCC Rcd. 6476, 6480 ¶ 19 (1994) (*"Orbcomm First Round Authorization Order"*).

[52] *Id.* at 6478, 6480.

[53] *License Order*, 13 FCC Rcd. at 6636 ¶ 50.

[54] *License Order* 13 FCC Rcd. at 6626 ¶¶ 18-19; *Report and Order* 13 FCC Rcd at 9132 ¶ 55.

[55] Amendment at 52.

increase in demand for channels created an increased potential for interference to these other systems and was therefore a major amendment.[56]

32. Final Analysis argues here that the Bureau was wrong because there is no correlation between the number of satellites in a Little LEO constellation and the level of demand on the uplink spectrum.[57] Final Analysis maintains that downlink spectrum capacity naturally limits the amount of data that can be transferred by a system.[58] Final Analysis claims that the Bureau acknowledged this limitation when it granted Orbcomm's amendment to increase the orbital altitude of its system by 50 kilometers.[59] In doing so, the Bureau stated that the increased altitude would not increase the amount of data its system could transfer in the uplink band at a given time because the system was limited by the downlink spectrum.

33. Final Analysis also argues that regardless of downlink constraints, uplink usage must be measured by total system throughput.[60] Final Analysis contends that its original constellation had 26 satellites, each with 14 Very High Frequency ("VHF") receivers, operating up to 19.2 kilobits per second ("kbps"). It claims that its total potential system uplink data throughput was 6,989 kbps. Final Analysis claims that its amended constellation design (32 satellites, each with 14 VHF receivers operating at 9.6 kbps) would result in a total system uplink throughput of only 4,301 kbps. Final Analysis claims that the potential increase in uplink spectrum usage caused by the proposed constellation design changes will be offset by a reduction in its uplink data throughput. Final Analysis further notes that in the First Round, the Bureau permitted Orbcomm to increase the number of its satellites from 20 to 36 without considering the impact on the use of the uplink spectrum.[61]

34. In a subsequent *ex parte* pleading, Final Analysis asserts that there is no generally established measure to gauge the potential interference for operations of dynamic channel activity assignment systems, as there is, for example with the use of effective isotropically radiated power ("EIRP") or power flux-density ("PFD") for downlink power usage.[62] Final Analysis offers to certify that the constellation proposed in its Amendment would not make any greater utilization of uplink channels in the 148-149.9 MHz band than would have been possible if it implemented the 26-satellite constellation it originally proposed.[63] Final Analysis also notes that the Bureau approved E-SAT's amendment to increase its simultaneous uplink users from 12 to 81.[64]

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[56] *License Order*, 13 FCC Rcd. at 6636 ¶ 50.

[57] Application for Review at 13. Final Analysis proposes to increase the number satellites from 26 to 32, and to change the inclination and increase the number of planes.

[58] Application for Review at 13.

[59] Application for Review at 13 (citing *Orbital Communications Corp.*, Order and Authorization, 13 FCC Rcd. 10828 at ¶ 24 (Int'l Bur., 1998) ("*Orbcomm Second Round Authorization Order*")).

[60] Final Analysis Reply Comments to Leo One at 6.

[61] Application for Review at 13. Leo One also points out that Orbcomm increased the number of satellites in its constellation in the context of a First Round settlement agreement, where it also agreed to minimize interference by powering down when one of its satellites was in the main beam of the only other system's downlink antenna. Not only is there is no comparable agreement in this case, but Leo One contends in the course of negotiating the Joint Proposal, Final Analysis never disclosed to the other applicants its intention to make changes to its constellation design. Leo One Opposition at 18.

[62] Letter from Aileen A. Pisciotta, Counsel to Final Analysis, to Regina Keeney, Chief, FCC, International Bureau at 7 (Nov. 5, 1998).

[63] *Id.*

[64] *Id.* at 9.

35. As Final Analysis correctly notes, there is no agreed-upon method to measure potential interference among the DCAAS Little LEO systems. We are not in a position to dictate such a measure, which is necessarily based upon a set of subjective assumptions about worst-case scenarios. Consequently, we look to the Joint Proposal among the Second Round Little LEO applicants as the baseline for the shared uplink band. We find that due to the limited amount of uplink spectrum, the scarcity of usable uplink channels and the fact that three Little LEO DCAAS-like systems share this spectrum, it is likely that any additional demand for usable DCAAS channels will exceed their limited supply.[65] Thus, any increase in one of the Little LEO DCAAS-like system's uplink spectrum usage would likely come at the expense of another Little LEO system, barring its access to the uplink spectrum and increasing the probability of channel collision, where two Little LEO DCAAS-systems attempt to transmit on the same uplink DCAAS channel at the same time. We would reconsider Final Analysis's proposal if all Little LEO licensees agree on a transparent measure that mitigates increases in uplink interference potential. Likewise, we would consider modification applications that are based upon mutual agreements, among all affected licensees, to revise the Joint Proposal.

36. We do not accept Final Analysis's assertion that uplink usage determined on the basis of a system's total data throughput can be used as the parameter to assess the impact of Final Analysis's proposed constellation modifications on the Little LEO uplink sharing environment. Because the level of Little LEO user activity is not uniform throughout the day, the effect of Final Analysis's system design modifications cannot be assessed in terms of the average daily data throughput. An increase in the system's demand for uplink DCAAS channels during a peak user traffic period, for example, may bar access to uplink spectrum for other DCAAS-like Little LEO systems during that time.

37. While we recognize Final Analysis's argument that unavailability of downlink spectrum to accommodate increased uplink data flow may curtail Final Analysis's system's requirements for additional uplink channels, we do not accept this as an effective limit on Final Analysis' usage of uplink channels, because it does not address peak usage times. Unavailability of downlink spectrum is also not an effective limit on uplink channels usage when space stations incorporate computers with message store and forward capability.

38. We find Final Analysis's reliance on the Second Round Orbcomm license unpersuasive.[66] When the Bureau evaluated Orbcomm's request to increase orbital altitude from 775 km to 825 km, the Bureau found that the change resulted in an increase of geographical coverage but did not increase user traffic intensity because the system's downlink capacity remained unchanged.[67] The Bureau correctly concluded that Orbcomm's proposed modification would not increase its ability to accommodate additional users – as measured by increased demand for DCAAS channels – nor would it negatively impact other Little LEO systems operating with DCAAS.

39. We also find unpersuasive Final Analysis's argument that the First Round decision allowing Orbcomm to increase the number of satellites in its system supports Final Analysis's request to operate additional satellites.[68] The Bureau did not have uplink spectrum sharing concerns with Orbcomm's First Round request to increase the number of satellites because at the time Orbcomm did not share its uplink spectrum with any other DCAAS-like Little LEO systems and thus did not affect any other operators.[69]

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[65] *License Order*, 13 FCC Rcd. at 6636 ¶ 50; Letter from Stephen L. Goodman, Counsel for Orbcomm, to Regina Keeney, Chief, FCC, International Bureau at 2 (Oct. 21, 1998); Letter from Robert A. Mazer and Albert Shuldiner, Counsel for Leo One, to Regina Keeney, Chief, FCC, International Bureau at 2 (Nov. 18, 1998).

[66] Application for Review at 13.

[67] *Orbcomm Second Round Authorization Order*, 13 FCC Rcd. at 10838 ¶ 24.

[68] Application for Review at 11.

[69] *Orbcomm First Round Authorization Order*, 9 FCC Rcd. at 6480.

Orbcomm was authorized to operate throughout the entire uplink spectrum until the STARSYS system was operational, at which point the First Round applicants' sharing agreement provided that Orbcomm would operate throughout the upper portion of the uplink band. The Commission emphasized that the First Round applicants had merely negotiated a manner of coordinating their systems before licensing, but that nothing in their licenses granted either First Round applicant exclusive use of the uplink frequency bands.[70] Both First Round applicants assured the Commission that their modulation schemes allowed for sharing with future systems. In this case, however, Final Analysis must share its uplink frequencies with Orbcomm and Leo One, but it did not negotiate a means of coordinating that sharing.

40. Similarly misplaced is Final Analysis's reliance on the Bureau's approval of E-SAT's proposed increase in the number of simultaneous uplink subscribers.[71] E-SAT's CDMA system, and interference decisions involving it, are not readily comparable to Final Analysis and the other two FDMA/TDMA systems. The Bureau allowed E-SAT to modify its system, but only within an interference envelope defined by a measurable and independently verifiable limit parameter, which is aggregate uplink effective isotropic radiated power.[72] To the contrary, Final Analysis proposes daily data throughput as the limiting factor for its uplink utilization, a measure that is unacceptable for uplink limitation at peak usage times. We know of no other practical means to monitor and enforce a limitation on uplink usage.

41. Finally, with respect to future proposals for constellation design changes, we acknowledge Final Analysis's offer to certify that its proposed constellation will limit its use of the uplink spectrum to that proposed in its original 26-satellite constellation, by adjusting uplink data rates, channel bandwidth, and the number of on-board receivers.[73] Unfortunately, however, Final Analysis does not substantiate its proposal with the necessary technical details. Instead, Final Analysis argues that these details can be worked out in consultation with other licensees during post-licensing coordination.[74] Given that Final Analysis's proposal is based on an unverifiable formula for measuring uplink requirements, that it includes no implementation specifics, and that the Little LEO licensees sharing this band co-frequency with Final Analysis do not concur, we will not overturn the Bureau's finding that Final Analysis's proposed constellation changes are major amendments.

42. Consequently, we affirm the Bureau's finding that the constellation modifications proposed to operational satellites in Final Analysis's Amendment constitute major amendments because they increase the potential for interference to other systems operating in shared uplink and downlink frequency bands. We reverse the Bureau decision to deny authority for launch of additional non-operational, on-orbit spare satellites. Non-operating spare satellites do not create any potential for interference.

2. Downlink Power Increase

43. In the *License Order*, the Bureau denied Final Analysis's request to increase its downlink EIRP from 12.8 dBW to 17.8 dBW, finding that the change increased the potential for interference to other Little LEO licensees.[75] The Bureau reasoned that any increase in Final Analysis's satellite transmit

[70] *Id.* at n.32.

[71] Letter from Aileen A. Pisciotta, Counsel to Final Analysis, to Regina Keeney, Chief, FCC, International Bureau at 9 (Nov. 5, 1998).

[72] *E-SAT, Inc.*, Order and Authorization, 13 FCC Rcd. 10859, 10871 at ¶ 29 (Int'l Bur. 1998).

[73] Letter from Aileen A. Pisciotta, Counsel to Final Analysis, to Regina Keeney, Chief, FCC International Bureau at 3 and 10 (Nov. 5, 1998).

[74] *Id.*

[75] *License Order* 13 FCC Rcd at 6642 ¶¶ 66-67.

power level would degrade the link margins of other satellite systems, particularly E-SAT's system, which shares downlink spectrum with Final Analysis.[76] In its Application for Review, Final Analysis argues that there are inconsistencies in the *License Order* on this issue.[77] Final Analysis asserts that the Bureau erred in determining that increasing the maximum downlink transmit power level constituted a major amendment.[78] Subsequent to the Bureau's findings, Final Analysis filed a number of documents further describing its downlink power proposal. Final Analysis explained that while its Application proposed three VHF transmitters per satellite, each with an EIRP of 12.8 dBW, its Amendment proposed just one VHF transmitter per satellite operating at an EIRP of 17.8 dBW.[79] Final Analysis claims that the overall impact, considering the reduction in the number of transmitters per satellite as well the increase in power, is a negligible change in total EIRP from 17.6 dBW to 17.8 dBW.[80]

44. Final Analysis subsequently provided information to clarify the impact of its increased downlink power on the overall spectrum sharing environment. [81] We agree that, as clarified, Final Analysis's proposal to increase transmit power includes an accompanying reduction in the number of transmitters per satellite. The net result is a negligible change in total EIRP with respect to E-SAT's CDMA system. We also acknowledge the statement of NTIA's position with regard to Final Analysis' proposed increase in EIRP in the 400.15-401.00 MHz band, which notes that while "there is some potential for increased out-of-band interference… this should not pose an insurmountable problem to the [government] systems."[82]

45. Because Final Analysis's proposal to increase downlink transmit power while reducing the number of transmitters per satellite does not increase the potential for interference, it is not a major amendment. Consequently, it may be granted under our rules.[83] In light of Final Analysis's clarification, we reverse the Bureau's finding, and grant Final Analysis authority to operate its Little LEO satellite system at an increased downlink EIRP of 17.8 dBW provided that it operates only one VHF transmitter per satellite.

3. Uplink Power Increase

46. The Bureau found that Final Analysis's proposed change to increase uplink subscriber transmit power from 10W to 20W increased the potential for interference.[84] Specifically, the Bureau found that any increase in Final Analysis's user terminal transmit power would result in a corresponding

[76] *Id.*

[77] Application for Review at 14.

[78] *Id.*

[79] Letter from Aileen A. Pisciotta and Todd D. Daubert, Counsel to Final Analysis, to Regina Keeney, Chief, International Bureau, FCC, Attachment A at 6 (Sept. 28, 1998).

[80] The overall impact is the aggregate EIRP from the three transmitters, each with an EIRP of 12.8 dBW. The calculation of the aggregate is therefore (10 Log 3) + (12.8 dBW) = 17.6 dBW.

[81] Letter from Aileen A. Pisciotta and Todd D. Daubert, Counsel to Final Analysis, to Regina Keeney, Chief, International Bureau, FCC, Attachment A at 6 (Sept. 28, 1998).

[82] Letter from William T. Hatch, Acting Associate Administrator, Spectrum Management, NTIA, to Thomas S. Tycz, Chief, FCC Satellite Radiocommunication Division, at 3 (Dec. 11, 1998).

[83] 47 C.F.R. § 25.116(b).

[84] *License Order* 13 FCC Rcd at 6641 ¶¶ 63-65.

increase in inter-system noise level for all Little LEO systems sharing uplink spectrum in the 148-149.9 MHz band.[85] The Bureau therefore denied this request.

47. While Final Analysis, in its Application for Review, asked us to review the Bureau's denial of its proposed increase in uplink power, it later rescinded that request.[86] Final Analysis now accepts the 10W limit requested in its Application and authorized by the *License Order*.

4. Increased Number of Uplink Receivers

48. The Bureau found that Final Analysis's proposal to increase the number of uplink channels from 12 to 40 per satellite would reduce the availability of DCAAS channels in the 148-149.9 MHz band to the three other Little LEO systems operating in this band – Leo One, Orbcomm and E-SAT.[87] The Bureau therefore denied Final Analysis's proposed increase in the number of uplink receivers as a major amendment.

49. In its Application for Review, Final Analysis notes that its original system design was based on 14 VHF uplink receivers.[88] Final Analysis contends that it must build a total of 40 uplink receivers to enhance the reliability, flexibility and efficiency of its satellites.[89] Final Analysis also believes that the Commission has not limited the number of uplink receivers in past cases.[90] In any case, Final Analysis notes that the Bureau mistakenly limited the number of receivers to 12, rather than the 14 it requested in its original Application.

50. Leo One claims that, if implemented, the Final Analysis's proposal to increase the number of receivers would virtually preclude Leo One's uplink operations.[91] Orbcomm also argues that the proposed modification raises the potential for interference in the 148-149.9 MHz band.[92] In reply, Final Analysis indicates that although it plans to build 40 uplink receivers, it is not requesting authority to use all 40 receivers now. Final Analysis therefore argues that there is no potential for increased interference in the 148-149.9 MHz uplink band.[93]

51. We find that Final Analysis has not clearly indicated how many space station receivers it intends to operate.[94] Final Analysis says only "it is not applying for authority to operate at the built-in level."[95] We recognize that in more recent filings Final Analysis has clarified its intention to limit the

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[85] *Id.* at 6641 ¶ 64.

[86] Letter from Aileen A. Pisciotta, Counsel to Final Analysis, to Regina Keeney, Chief, FCC, International Bureau at 3 (Nov. 5, 1998).

[87] *License Order* 13 FCC Rcd. at 6639 ¶ 58.

[88] Application for Review at 17. Although the Bureau mistakenly described the original design as containing 12 receivers rather than 14, that mistake has no bearing on the decision to deny Final Analysis's proposal to increase the number of receivers to 40.

[89] Application for Review at 17.

[90] Application for Review at 17 (citing *First Round Little LEO Report and Order*, 8 FCC Rcd 8450, 8455, n.38 (1993)).

[91] Opposition of Leo One at 21.

[92] Comments of Orbcomm at 5.

[93] Reply to Orbcomm at 3.

[94] Amendment at 23, Figure II-5b.

[95] Amendment at 25, fn.28.

number of active VHF receivers to 14.[96] We modify the *License Order* to correct the number of active receivers per satellite in the 148.0-149.9 MHz band to 14, in accordance with its Application, System 2 in the Joint Proposal, and the *Report and Order*. Because we have eliminated the construction permit requirement for space stations, Final Analysis may incorporate as many receivers in its satellites as it wishes, at its own risk.[97] Pursuant to Commission rules, Final Analysis must notify the Commission in writing that it plans to begin construction at its own risk.[98] If Final Analysis wishes to increase the number of receivers that it operates, it must file a modification application seeking authority to do so. We will consider such an application, together with any comments or oppositions to the application, without regard to the number of receivers with which the satellites are equipped.

5. Data Rate Increase

52. In its Amendment, Final Analysis specified that it intended to construct its satellites with the capacity to accommodate different data rates: one set of data rates that conforms to System 2 parameters and another set that describes the range of system's capability.[99] The Bureau authorized Final Analysis to operate only at the data rates that conform to System 2 capabilities.[100] In its Application for Review, Final Analysis argues that it should be allowed to construct its satellites with capacity for higher data rates as well, to take advantage of future spectrum that may be assigned to it. Final Analysis claims that denying it authority to design such capability into its satellites "completely vitiates the priority for future spectrum upon which the ultimate success of System 2 will rely."[101]

53. In the *Report and Order*, we granted System 2 — the Final Analysis system — first priority to apply for a limited amount of spectrum that may be available in the future.[102] Final Analysis has since clarified that the higher data rates it seeks are for future capability, and that it is not now seeking authorization for data rates beyond the parameters of System 2. Since the *License Order* authorized data rates consistent with the capacity of System 2, we find that Final Analysis's request is permissible. We find that the Bureau's authorization of Final Analysis's system is consistent with the *Report and Order* in this regard, and we affirm it.[103] With this and several other technical parameter requests, Final Analysis appears to be seeking Commission pre-approval of future capability. Like every other satellite licensee, Final Analysis does not need Commission authority to construct any satellite it desires.[104] Nevertheless, construction is at Final Analysis's own risk and will have no bearing on the Commission action on any modification application Final Analysis may file to operate at these higher data rates.[105]

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[96] Reply to Orbcomm at 3.

[97] *Streamlining The Commission's Rules And Regulations For Satellite Application And Licensing Procedures,* Report and Order, 11 FCC Rcd. 21581 (1996).

[98] 47 C.F.R. § 25.113(f).

[99] Amendment at 31.

[100] *License Order*, 13 FCC Rcd. at 6638 ¶ 54

[101] Application for Review at 21.

[102] *See Report and Order*, 13 FCC Rcd at 9127 n 69.

[103] *License Order*, 13 FCC Rcd. at 6639, 6642 ¶¶ 56, 68.

[104] *See Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures*, Report and Order, 11 FCC Rcd. 21581, 21583-85 (1996).

[105] *See id.* at 21585 ¶ 9.

6. Link Changes – Downlink Subscriber and Feeder Links; Uplink Feeder Links

54. The Bureau denied Final Analysis's proposal to increase the number of subscriber downlinks from 9 to 12, increase the number of feeder downlinks from 3 to 4, and increase the number of feeder uplinks from 1 to 4. The Bureau found that these increases were not necessary to conform to the *Report and Order* and they increased the potential for interference.[106]

55. In its Application for Review, Final Analysis says that its Amendment described an optimal system configuration.[107] Final Analysis argues that it did not propose an increase in the number of subscriber downlinks, feeder downlinks, or feeder uplinks. We acknowledge this clarification, which leaves Final Analysis's authorized parameters unchanged with regard to subscriber downlinks, feeder downlinks, and feeder uplinks.

C. Other Arguments

56. In its Application for Review, Final Analysis argues that the *License Order* reflects procedural anomalies that have denied Final Analysis due process.[108] Final Analysis makes two arguments in this regard. First, Final Analysis argues that the Bureau relied on "informal" e-mails and a letter from NOAA and NTIA that were never served on Final Analysis or placed in the public record.[109] Final Analysis further contends that because neither of the analyses provided by NTIA/NOAA recommended that the Bureau deny Final Analysis's proposal to increase the number of satellites in its constellation, the Bureau should not have relied upon them. Second, Final Analysis argues that the *License Order* imposes a new substantive rule on Final Analysis, requiring it to shut down its system immediately upon detection of a time-sharing failure with NOAA. Final Analysis argues that this requirement is not contained in the Commission's rules, and violates the prohibition on agency rulemaking without notice or opportunity for comment.[110] We find neither of these arguments persuasive.

57. As to the Bureau's reliance on the NTIA/NOAA letters, these were not the only source of data on which the Bureau based its denial of Final Analysis's request to increase the number of authorized satellites. The comments filed by other Little LEO applicants and the Bureau's own engineering analysis -- which independently concluded that there was potential for increased interference -- contained substantially similar data. Final Analysis had a full opportunity to respond to these other sources.

58. Furthermore, the Bureau's actions complied with the Commission's *ex parte* rules. The rules state that presentations to or from an agency or branch of the Federal Government or its staff involving matters of shared jurisdiction are deemed exempt under the rules and are therefore permissible.[111] The rule further states that if the presentation is not submitted for the record, it is to be disclosed no later than

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[106] *License Order*, 13 FCC Rcd. at 6639 ¶ 56.

[107] Application for Review at 21.

[108] Final Analysis Application for Clarification and Review at 23.

[109] Final Analysis Application for Review at 24. *See* Letter from Jim Vorhies, NTIA, to Harry Ng, International Bureau, FCC (Dec. 29, 1997) ("Vorhies Letter"); e-mail from Frank Eng, NOAA, to David McGinnis, NTIA (Dec. 4. 1997) (attached to Vorhies Letter); e-mail from Frank Eng, NOAA, to David McGinnis, NTIA (Dec. 15. 1997) (attached to Vorhies Letter).

[110] Application for Review at 24.

[111] 47 C.F.R. § 1.1204(a)(5). *See Amendment of Subpart H, Part 1 of the Commission's Rules and Regulations Concerning Ex Parte Communications and Presentations in Commission Proceedings*, 2 FCC Rcd. 3011, 3018 (1987); *Amendment of 47 C.F.R. § 1.1200 et seq. Concerning Ex Parte Presentations in Commission Proceedings*, 12 FCC Rcd. 7348, 7367 (1997).

at the time of release of the Commission's decision. At the time of the Bureau's decision, all letters were placed in the public record.

59. More significantly, our review of the record reveals that Final Analysis had a full opportunity to review and respond to the communication that is the root of its claim. The Application for Review concedes that "the substance of Mr. Eng's message was relayed to Final Analysis on January 23, 1998 by letter from Mr. Vorhies of NTIA to Mr. Grimes of Final Analysis."[112] More than simply relaying the substance, Mr. Vorhies's letter to Final Analysis repeats, *verbatim*, the entire relevant paragraph in Mr. Eng's December 4, 1997 e-mail discussing the increased potential for interference from Final Analysis's proposed constellation design changes. Final Analysis responded, stating its contradictory view on the increased potential for interference.[113] Thus, Final Analysis had notice of, and commented on, the NTIA/NOAA interference analyses before the Bureau acted on its license application.

60. After the license was issued, and in response to NTIA's statement that the Vorhies Letter and Mr. Eng's e-mails were preliminary staff communications, the Commission asked NTIA to provide its final agency view on whether Final Analysis's proposed constellation design changes increase the potential for interference to government systems in the share bands.[114] Final Analysis responded to the subsequent NTIA letter, and later filed a series of *ex parte* letters with the Commission, in which it stated its views on the issue.[115] We have considered those views here.[116]

61. Final Analysis also argues that despite NTIA's concerns, NTIA did not recommend denying its proposed changes. This argument misconstrues the respective administrative responsibilities. The Commission looks to the expertise of the NTIA to determine when government radio frequency users are affected by commercial radio frequency use that is licensed by the Commission. In this case, the Commission then applied the information provided by NTIA to decide whether, under the Commission's rules, Final Analysis's amendments could be considered. NTIA and NOAA were not asked -- and have no responsibility to decide or recommend -- how this Commission should act on an application made under its rules.

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[112] Application for Review at 23-24.

[113] *See* Application for Review at 24 (citing February 26, 1998 letter from David Grimes of Final Analysis to Jim Vorhies, NTIA).

[114] *See* Letter from William T. Hatch, Acting Associate Administrator, NTIA, to William E. Kennard, Chairman, FCC (June 11, 1998); Letter from Kathy D. Smith, Acting Chief Counsel, NTIA, to Magalie Roman Salas, Secretary FCC (June 11, 1998) (parties to the proceeding served with June 11, 1998 Hatch letter to Kennard); *see also*, discussion at ¶¶ 25-26, *supra*.

[115] Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Regina Keeney, Chief, FCC International Bureau (Dec. 24, 1998); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Regina Keeney, Chief, FCC International Bureau (Jan. 21, 1999); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Roderick K. Porter, Acting Chief, FCC International Bureau (May 24, 1999); Letter from Nader Modanlo, Chairman and President, Final Analysis Communications Services, Inc., to William T. Hatch, Acting Associate Administrator, NTIA (May 20, 1999); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Roderick K. Porter, Acting Chief, FCC International Bureau (June 15, 1999); Letter from Nader Modanlo, Chairman and President, Final Analysis Communications Services, Inc., to William T. Hatch, Acting Associate Administrator, NTIA (July 19, 1999); Letter from Aileen A. Pisciotta, Counsel to Final Analysis Communication Services, Inc, to Donald Abelson, Chief, FCC International Bureau (Nov. 16, 1999). *See Application for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from MediaOne Group, Inc., Transferor to AT&T Corp., Transferee*, 16 FCC Rcd. 5610, 5612 (2001).

[116] *See* discussion at ¶¶ 23-29, *supra*

62. We also do not accept Final Analysis's second argument, that the *License Order* imposes a new substantive rule upon it. The rules adopted in the *Report and Order* require NVNG licensees to cease transmissions when their satellite footprints enter a NOAA protection area. Section 25.259(a) of the Commission's rules states that "a non-voice, non-geostationary mobile-satellite service system licensee, time-sharing spectrum in the 137-138 MHz frequency band shall not transmit signals into the protection areas of NOAA satellite systems… a NVNG licensee will cease its transmissions prior to the NVNG licensee's satellite overlapping the NOAA protection area…."[117] In adopting this rule after full comment on the record, the Commission explained that "if System 2 [Final Analysis] is causing unacceptable interference to the NOAA system, the Commission will require that System 2 *immediately* terminate its interfering operations, wherever located."[118] Neither Final Analysis nor any other party filed a petition for reconsideration of the *Report and Order* or this particular rule. We will not entertain Final Analysis's request to revisit the shutdown requirement, several years after its adoption. We therefore reject Final Analysis's arguments that the Bureau denied it due process.

D. Leo One Application for Review

63. Leo One filed an Application for Review of the Final Analysis *License Order* that is both contingent upon our decision on Final Analysis's Application for Review, and may be – as Final Analysis argues in response – procedurally defective and premature.[119] The substance of Leo One's argument is that if the decision on Final Analysis's Application for Review allows an expansion of its system, the Joint Proposal for spectrum sharing will be destroyed. If that happens, the Commission should go back to review the financial qualifications of Final Analysis. Because we affirm the Bureau's *License Order*, the issues raised by Leo One are rendered moot.

IV. ORDERING CLAUSES

64. Accordingly, IT IS ORDERED, that the Application for Clarification and Review filed by Final Analysis Communications Services IS GRANTED, in part, and IS DENIED, in part;

65. IT IS FURTHER ORDERED that we affirm the Bureau's decision to deny the following constellation design changes: 1) increasing the number of satellites from 26 to 32; 2) increasing the number of orbital planes from four to six; and 3) decreasing the orbital inclination from 66 to 51 degrees;

66. IT IS FURTHER ORDERED that Final Analysis Communication Services, Inc. IS AUTHORIZED to launch six spare on-orbit satellites;

67. IT IS FURTHER ORDERED that Final Analysis's request to increase downlink EIRP from 12.8 dBW to 17.8 dBW IS GRANTED, and its license modified accordingly;

68. IT IS FURTHER ORDERED that Final Analysis's license is corrected to specify that it is authorized to operate 14 active receivers per satellite in the 148.0-149.9 MHz band;

69. IT IS FURTHER ORDERED that the Application for Review filed by Leo One USA Corporation IS DISMISSED;

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[117] 47 C.F.R. § 25.259(a); *Report and Order*, Subpart C – Technical Standards, 13 FCC Rcd. at 9167.

[118] *Report and Order*, 13 FCC Rcd at 9144 (emphasis added).

[119] Leo One USA Corporation, Application for Review (filed May 1, 1998).

70. IT IS FURTHER ORDERED that the Petition for Reconsideration filed by Final Analysis Communication Services, Inc. on May 14, 1998 IS DISMISSED.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary