

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
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Policy Branch
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In the Matter of

Proposals to Permit Reducing
Orbital Spacings Between U.S.
Direct Broadcast Satellites

Report No. SPB-196

REPLY COMMENTS OF LORAL SPACECOM CORPORATION

Loral SpaceCom Corporation (Debtor-in-Possession) ("Loral SpaceCom"), and Loral Space & Communications Ltd. (Debtor-in-Possession), hereby submit reply comments on the above-captioned Public Notice regarding proposals to permit reduced orbital spacings between U.S. Direct Broadcast Satellites ("DBS").¹

Loral, through its subsidiaries, holds authorizations for Broadcasting Satellite Service ("BSS") satellites, to be located at 96.5° W.L. and 123.5° W.L., through the Isle of Man. From these orbital positions, Loral will be able to offer additional capacity to DBS programmers and system operators to provide DBS programming and new data broadcast applications to customers in the United States and in other Region 2 areas that are currently underserved.

I. INTRODUCTION

The Commission should consider and act on applications it receives from BSS satellite operators for authorization to serve the U.S. market from "tweener" orbital locations. Allowing "tweener" BSS satellites to serve the United States is technically

¹ *International Bureau Seeks Comment on Proposals to Permit Reduced Orbital Spacings Between U.S. Direct Broadcast Satellites*, Public Notice, Rpt. No. SPB-196, DA-03-3903 (rel. Dec. 16, 2003).

feasible, as discussed below and in the majority of other comments in this proceeding. Reduced BSS orbital spacing is possible now in light of the development of advanced coding and modulation techniques. By relying on existing ITU coordination procedures, the Commission can authorize new BSS services from “tweener” orbital slots without causing unacceptable interference to existing U.S. systems by simply conditioning any such authorizations on completion of ITU coordination, a standard FCC satellite service authorization condition. Indeed, U.S. DBS operators have implemented several advances in BSS satellite technology via existing ITU coordination procedures. New “tweener” BSS authorizations will serve the public interest by promoting three key Commission policy objectives: (1) to increase the utilization of scarce spectrum resources, (2) to facilitate the delivery of new communications services to the U.S. market, and (3) to increase competition in the DBS satellite services market.

II. TECHNOLOGICAL ADVANCEMENTS HAVE CREATED A BSS INDUSTRY SIGNIFICANTLY DIFFERENT FROM THAT CONTEMPLATED BY THE REGION 2 BSS BAND PLAN.

Two principal technological advances have made reduced BSS orbital spacing feasible: (1) the introduction of digital modulation with more powerful error correction, and (2) the advent of low-cost digital video decompression systems. These technological changes have made it possible for U.S. and non-U.S. BSS operators to implement systems that are radically different and more spectrum efficient than those contemplated by the original ITU Region 2 BSS plan.

The original Region 2 plan was designed to apply to high-power satellites employing analog modulation, with a single video channel per carrier at a bandwidth of 24 MHz, elliptic coverage area beams designed to cover approximately a single country,

and the use of one-meter antennas at consumer premises. The development of new digital modulation and more efficient error correction codes have resulted in the use of much smaller (45-cm) antennas at consumer premises and satellite beams that cover a broad area, combined with spot beams to cover individual designated market areas. Advances in digital compression techniques have significantly increased video channel capacity. These technological advancements have made a reduced spacing environment for BSS satellites technically feasible while supporting the needs of the DBS industry to ensure continued use of small antennas and bandwidth for spot beams for BSS customers.

One key characteristic of digital BSS systems that permits orbital spacing at significantly less than nine degrees is the ability to operate with low error rates even if the Carrier-to-Noise plus Interference ratio ($C/[N+I]$) values are in the range of 5–7 dB. This is possible because of the use of more powerful error correction codes. With the placement of a new BSS satellite adjacent to a currently operating BSS satellite system, the $C/[N+I]$ of the older BSS systems will degrade, but through coordination the loss can be kept at an acceptably low value. The criterion for “low-loss” can be defined using parameters such as loss of rain margin, or a single entry Carrier-to-Interference ratio (C/I), due to the new network. Limits can be agreed on for these parameters as a part of the normal ITU coordination process, and precedent established in ITU Region 1 and Region 3 digital broadcasting service plans can also be used as guidelines.

Considerable flexibility in such trade-offs is achieved by using the DVB-S2 standard,² which defines efficient error correction codes that require low overhead.

III. EXISTING ITU PROCEDURES PERMIT IMPLEMENTATION OF REDUCED BSS ORBITAL SPACING AND OTHER BSS PLAN MODIFICATIONS VIA COORDINATION OF INDIVIDUAL SATELLITE SYSTEMS

Existing ITU coordination procedures permit modifications to the Region 2 BSS plan based on satellite operators' ability to coordinate the operation of their satellite networks with the other affected satellite networks. The flexibility offered by the ITU Radio Regulations, including the handling of plan modifications through the coordination process, has permitted implementation of major technological advancements achieved in the satellite industry over the past 20 years.

The procedures set forth in Appendices 30 and 30A³ of the ITU Radio Regulations (AP30/30A) must be followed when an administration seeks to modify the BSS plan. Such modifications include the introduction of a space station at an orbital location not already included in the band plan. The sole criteria established in the ITU's Radio Regulations for modifications to the plan is whether the proposed modification accommodates existing satellites/filings through the coordination process. This process thus ensures adequate protection of existing and planned systems. The appendices establish a threshold so that, when a plan modification changes the overall protection margin for a BSS filing in the Region 2 plan by more than 0.25 dB, the new entrant must coordinate with the affected filings. This emphasis on interference protection, rather

² DVB-S2 is a second generation standard for Digital Video Broadcasting through satellites being developed by a consortium of broadcasters, manufacturers and operators.

³ Appendix S30 considers space-to-earth frequency assignments, while Appendix S30A addresses frequencies in the earth-to-space direction.

than orbital spacing, allows for the flexibility necessary to efficiently utilize scarce orbital resources by using "tweener" BSS satellites.

The operating characteristics of a new satellite entrant will best be determined through coordination with current and potential adjacent satellite operators. A currently deployed system may have several satellites at the same orbital location and a mix of broad-area beams and spot beams. The satellite power levels and frequencies to be used in the new system can then be optimized to protect the current services and maximize the capacity of the new system. Because every BSS orbital location that has currently deployed satellites has different beam and frequency configurations, the most efficient utilization of a new orbital location is realized through such optimization. The new system developer could potentially use 45–75-cm antennas in conjunction with the DVB-S2 for the most efficient utilization of the new orbital location.

U.S. BSS satellite operators have successfully used the ITU modification process described above to upgrade and enhance their BSS networks. For example, over the last several years, they have filed modifications to change from analog to digital format and from one-meter antennas to 45-cm antennas, to introduce spot beams on their satellites, and to extend the service area of US BSS satellites to cover Mexico. All of these changes were introduced and implemented simply by using existing ITU procedures for modifications.

In keeping with the practice of using the ITU process for implementing modifications to the BSS Plan in Region 2, Loral has filed its own modifications to the Region 2 plan that would permit operation of its future BSS-1 satellite at 96.5° W.L., located 4.5 degrees from DirecTV's satellite at 101° W.L. and 5.5 degrees from Telesat

Canada's satellite filing at 91° W.L., and its future BSS-2 satellite at 123.5° W.L, 4.5 degrees from the EchoStar and DirecTV satellites operating at 119° W.L. Loral's satellite systems will be operated in accordance with ITU coordination arrangements negotiated by affected satellite operators and coordination agreements between the affected administrations.

To facilitate the coordination of these satellites, Loral has participated in more than six bilateral coordination meetings in the past thirteen months between the United States and Great Britain⁴ and their respective operators. Loral's ITU filings and its coordination discussions, to date, are predicated on its belief that its planned satellite network(s) can be coordinated with existing BSS satellites authorized by the United States for mutually acceptable operations. It is the existing ITU process that has allowed for this process to move forward productively.

IV. CONCLUSION

Over time, BSS operators have used the existing ITU process to implement new technological advances to provide additional DBS services and greater spectrum efficiency. The technological advancements that permit DBS satellites to operate and to be successfully coordinated at less than nine degree orbital spacing are no different. To promote increased spectrum efficiency, provision of new DBS services to consumers, and increased competition, the Commission should consider and act on applications it receives from BSS satellite operators for authorization to serve the U.S. market from "tweener" orbital locations and condition authorizations of such "tweener" satellites on completion of the existing ITU coordination procedures.

⁴ Great Britain is the administration through which the Isle of Man has made its submissions to the ITU.

Respectfully submitted,

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Engineering Certification

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in these reply comments of Loral SpaceCom Corporation; that I am familiar with Parts 21 and 25 of the Commission's rules; that I have either prepared or reviewed the engineering information contained in the underlying application; and that it is complete and accurate to the best of my knowledge.

Dated the 13 day of February 2004

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CERTIFICATE OF SERVICE

I, Dennette Manson, do hereby certify that on this 13th day of February 2004, copies of the foregoing Reply Comments of Loral SpaceCom Corporation were delivered by first-class, postage-prepaid mail, unless otherwise indicated, to the following parties:

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