

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)	
)	
Procedures to Govern the Use of Satellite)	
Earth Stations on Board Vessels in Bands)	IB Docket No. 02-10
Shared With Terrestrial Fixed Service)	
)	
)	

REPLY COMMENTS OF THE NSMA

1. The National Spectrum Managers Association (NSMA) respectfully submits the following Reply Comments in the above-captioned proceeding. The Commission’s Notice of Inquiry (Notice), released on February 4, 2002, solicits comments on a variety of issues related to the authorization of satellite earth stations operated on board vessels (“ESVs”). Among the issues addressed by the Notice and some of the initial commenters is frequency sharing and potential RF interference from ESV operations to Fixed Service (FS) point-to-point microwave systems. These Reply Comments are focused on that issue.

2. The NSMA is a voluntary association of individuals whose work spans microwave and satellite engineering, frequency coordination and licensing. Individuals’ participation in the Association is supported by companies from virtually all sectors of the industry, including licensees, antenna and equipment manufacturers, consulting and engineering firms, regulatory law firms, representatives of government agencies, and private individuals. The NSMA’s mission is to address inter-system interference and frequency coordination issues of common interest, to supplement the Commission’s coordination-related regulations with technical and procedural recommendations to the industry and, on occasion, to offer objective comments to the Commission based on NSMA

consensus on coordination-related issues. Overall, we hope to assist the Commission in furthering the use of spectrum by helping to make the overall process of interference analysis and frequency coordination as effective and efficient as practicable.

3. As a result of the FCC's 1996 *Crescomm Waiver Order* and the Commission's suggestion of the NSMA as a forum to address ESV coordination issues, the NSMA has been addressing C-band ESV operations and frequency-sharing issues for more than five years. We have identified and discussed at some length issues related to interference analysis methodologies, microwave interference protection criteria, and administrative and technical details related to ESV interference-avoidance and the related frequency coordination process. We have also followed with close interest the actions taken by the Commission on this subject, as well as the related ITU deliberations.

4. In its discussions, the NSMA was able to achieve reasonable consensus on several of the ESV issues we identified; however, the relative polarity of positions on some of the more significant issues unfortunately prevented the overarching consensus that we required of ourselves before taking a comprehensive public position, either in the form of NSMA recommendations or in public comments in regulatory proceedings.

5. There is, however, a fundamental principle on which the NSMA does voice consensus: we – like the Commission – support the effective and efficient use of spectrum among compatible services, and frequency sharing as a larger and more effective use of the spectrum – providing, of course, appropriate interference controls are available.

6. As stated in the Notice (para. 1), the Commission is interested in “potential methods for licensing ESVs that would help ensure that ESV operations would not cause harmful interference to, nor limit the growth of,

terrestrial fixed services operating in the same band.” At the same time, however, the Notice suggests concerns about the ability to identify an appropriate interference control methodology to accommodate frequency-sharing, and goes on to suggest the alternative possibility of ESV C-band operation only at great distances from shore, and Ku-band (unshared) operation when within distances closer to shore and where interference to microwave systems is possible¹.

7. As described in the Notice, the ITU has developed a series of draft recommendations involving ESV coordination with shared-band microwave systems. One draft recommendation² involves the determination of coordination contours for in-motion ESVs. The NSMA agrees with this recommendation and believes the contour distances specified are adequate for C- and Ku-band systems.

8. Another of the draft ITU recommendations addresses the method of interference analysis. The NSMA originally examined an analysis approach named the “Critical Contour Point” (CCP) methodology, which was generally accepted as a valid technique for determining worst-case interference into FS receivers. This technique assumes an operational contour within which the ESV

¹ We note that paragraph 26 of the Notice states “The current practice of frequency coordinators requires a search of up to 125 miles (approx. 200 km) around the proposed location of a new Fixed Satellite Service (FSS) earth station to ascertain if there is potential for interference.” The NSMA wishes to point out that the practice of coordinators is to use standard ITU methodology, which results in coordination distances that depend on the direction of interference (FSS to FS, or FS to FSS) and the related interference protection objective, basic propagation losses in the frequency band of interest, the horizon gain pattern of the FSS antenna, and other factors, and the FSS-FS coordination distances may range widely. The coordination distance used for FSS-FS coordination should not be confused with that for FS-FS coordination strictly among point-to-point microwave stations. For point-to-point microwave station coordination, coordinators once used a 125-mile circular coordination contour. However, coordinators now follow an NSMA recommendation to use a “keyhole-shaped” coordination contour, centered on the main beam of the antenna and, depending on the frequency band, extending as far as 250 miles inside a 10-degree keyhole and 150 miles outside that keyhole.

² PDNR ITU-R SF. [4-9S/ESV-A], “Methods for assessing the minimum distance from the coastline beyond which in-motion earth stations located on board vessels would not cause unacceptable interference to the fixed service”, (Questions ITU-R 226/9 and ITU-R 251/4), specifies 300 km for C-band and 125 km for Ku-band.

will always operate, and that for each victim FS receiver a worst-case interference point exists within the operational contour. The level of interference into each FS receiver is calculated based upon the position of this worst-case point.

9. As it became obvious that in-motion interference objectives could not be agreed to within the NSMA, though, we explored an alternate analysis methodology. The purpose of this new analysis technique was to preclude the need to have a general interference objective for all FS links. This method calculated the interference into each receiver based upon the motion of the ESV relative the specific position and operational parameters of FS station. While this method, named the Contour Integration Method (CIM), was generally agreed to in principal by all NSMA participants, it was determined that there was a significant flaw in the analysis if the ESV's motion and position are not modeled correctly; the analysis was not sophisticated enough to consider non-linear ESV motion. It can be said, though, that if non-linear ESV motion can be suitably described and modeled, the CIM method could be an effective interference analysis technique. We note that the ITU now has a draft recommendation³ describing an ESV in-motion analysis technique similar to the CIM method the NSMA addressed.

10. The NSMA is encouraged with the ITU's effort, and believe it represents evidence beyond the NSMA's discussions that the ESV frequency coordination issues can be resolved, and that shared-band operation is possible without harmful interference. Therefore, we encourage the Commission to keep the shared-frequency ESV operation option open until the issues can be resolved.

³ PDNR ITU-R SF. [4-9S/ESV-C], "Guidance for determination of the interference potential between earth stations on vessels and stations in the fixed service when the ESV is operating close to shore."

Respectfully submitted,

A handwritten signature in black ink, reading "Daniel J. Collins". The signature is written in a cursive style with a large, sweeping initial "D".

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