

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

In the Matter of:)
)
Amendment of Parts 2 and 25 of the) IB Docket No. 07-101
Commission’s Rules to Allocate Spectrum)
and Adopt Service Rules and Procedures to)
Govern the Use of Vehicle-Mounted Earth)
Stations in Certain Frequency Bands)
Allocated to the Fixed-Satellite Service)

To: The Commission

**COMMENTS OF THE NATIONAL
SPECTRUM MANAGERS ASSOCIATION**

The National Spectrum Managers Association (“NSMA”),¹ hereby submits its comments in response to the Commission’s Notice of Proposed Rule Making (“*NPRM*”) in the above-captioned proceeding.² In the *NPRM*, the Commission proposes to establish rules and policies for the licensing and use of vehicle-mounted earth stations (“VMESs”) in Ku-band frequencies.³ Because of the significant interest in these new services, particularly on the part of government users, NSMA supports the Commission’s effort to establish licensing and service rules for VMES operations. As discussed herein, however, the Commission should establish rules that

¹ NSMA is a voluntary association of individuals involved in the spectrum management profession. NSMA’s goal is to promote rational spectrum policy through consensus views formulated by representatives of diverse segments of the wireless communications industry.

² *Amendment of Parts 2 and 25 of the Commission’s Rules to Allocate Spectrum and Adopt Service Rules and Procedures to Govern the Use of Vehicle-Mounted Earth Stations in Certain Frequency Bands Allocated to the Fixed-Satellite Service*, IB Docket No. 07-101, Notice of Proposed Rule Making, FCC 07-86 (rel. May 15, 2007) (“*NPRM*”).

³ NSMA’s comments regarding VMES operations apply only to the Ku-band frequencies discussed herein. Although outside the scope of the instant proceeding, NSMA would note that disparate sharing environments may not support the provision of VMES services in other bands.

fully protect incumbent users of the Ku-band, including Fixed Service (“FS”), Fixed-Satellite Service (“FSS”), and government space research and radioastronomy operations.

I. DISCUSSION

In response to a petition for rule making filed by General Dynamics SATCOM Technologies, Inc. (“General Dynamics”) asking the Commission to designate Ku-band FSS spectrum for VMES operations, nearly all interested parties filed comments supporting the adoption of VMES rules based on the licensing regime established for earth stations on-board vessels (“ESVs”).⁴ As discussed herein, NSMA generally agrees that the regulatory regime adopted for ESVs is an appropriate basis upon which to develop rules for VMES services.

A. Allocation Issues

NSMA believes that the principal considerations for VMES licensing are (i) controlling potential interference from VMES transmissions to protect co-frequency operations; and (ii) ensuring that VMES receive operations do not adversely impact incumbent users. Subject to these fundamental principles, NSMA agrees that the Commission should permit the operation of VMESs as an application of the Fixed-Satellite Service (“FSS”) in the Ku-band.

1. Downlink Bands

NSMA supports adoption of footnote NGyy in Section 2.106 of the Commission’s Rules to modify the non-Federal FSS allocation to reflect that VMESs may operate as an application of the FSS in the 11.7-12.2 GHz downlink band, and thus may be authorized to communicate with FSS space stations on a primary basis. Such a footnote would ensure that

⁴ See *Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands*, Report and Order, 20 FCC Rcd 674 (2005) (“*ESV Report and Order*”).

VMESs operating in accordance with the Commission's Rules would receive protection from interference to the same extent that VSAT and ESV terminals receive protection.

NSMA also supports adoption of new footnote NGxxx in Section 2.106 of the Commission's Rules allowing VMESs to communicate with FSS space stations in the 10.95-11.2 GHz and 11.45-11.7 GHz downlink bands. In these band, however, VMES receive operations should be required to accept interference from existing and future FS stations operating in accordance with the Commission's Rules. Thus, VMES operations should be authorized in this band on an unprotected basis only. NSMA believes that unprotected VMES receive operations in the extended Ku-band would provide VMES licensees with operational flexibility without restricting other authorized operations, such as FS operations in the 10.7-11.7 GHz band.⁵

2. Uplink Band

NSMA supports the adoption of footnote NGyyy in Section 2.106 of the Commission's Rules to modify the non-Federal FSS allocation to reflect that VMESs may operate as an application of the FSS in the 14.0-14.5 GHz uplink band, and thus may be authorized to communicate with FSS space stations on a primary basis. VMESs use Ku-band FSS satellite transponders and protect co-frequency FSS operations by limiting aggregate off-axis EIRP spectral density level to that of routinely licensed VSATs. Accordingly, they can be afforded the same regulatory status applicable to other FSS operations.

However, additional conditions should be imposed to protect other users in various segments of the 14.0-14.5 GHz band that may receive harmful interference from VMES transmissions. The 14.0-14.2 GHz band is allocated to the space research service (Earth-to-space) on a secondary basis, and there are National Aeronautics and Space Administration

⁵ See *NPRM* ¶ 28.

(“NASA”) Tracking and Data Relay Satellite System (“TDRSS”) operations in the 14.0-14.05 GHz band in Guam and White Sands, New Mexico, as well as plans to establish a new TDRSS facility on the east coast of the United States.⁶ The Commission proposes to prohibit VMES operations within 125 kilometers of the TDRSS facilities, although it also requests comment on allowing VMES licensees to coordinate operations within 125 kilometers as a condition of licensing.⁷ Given that VMES operators heretofore have been able to successfully coordinate with NASA TDRSS operations, NSMA supports a coordination requirement as a condition of VMES licensing.

There are also secondary government fixed and mobile allocations in the 14.4-14.5 GHz band. The Commission notes that there are several fixed point-to-point operations and a limited number of fixed stations used by the government for terrestrial telecommand, as well as several government aeronautical mobile stations, land-based aeronautical mobile stations, land mobile stations, and surface telemetering mobile stations in the band.⁸ NSMA agrees that the Commission’s approach adopted in the ESV proceeding to address these limited operations -- applying standard primary/secondary sharing rules -- should be adopted in this proceeding.⁹

With respect to radioastronomy operations in the 14.47-14.5 GHz band, NSMA supports the Commission’s proposal to apply a coordination condition similar to that adopted for ESVs to VMES operations.¹⁰ NSMA believes that coordination directly with the National Science

⁶ *Id.* ¶ 31.

⁷ *Id.* ¶ 32.

⁸ *Id.* ¶ 36.

⁹ *Id.* ¶ 36 n.81 (citing *ESV Report and Order*, 20 FCC Rcd at 714-15 ¶ 95).

¹⁰ *Id.* ¶ 37 & n. 83.

Foundation (“NSF”) will effectively protect radioastronomy operations and that the Commission should be notified of the outcome of such coordination. NSMA also believes that VMES terminals should meet the standard unwanted emission requirements of Section 25.202(f) of the Commission’s Rules to protect radioastronomy sites from unwanted emissions.

B. Technical and Operational Requirements for VMES Operations

In the *NPRM*, the Commission asks whether the Ku-band ESV regulations should serve as a model for regulation of VMESs.¹¹ In general, NSMA believes that the ESV rules are the appropriate starting point for developing a VMES regulatory regime that would adequately protect co-frequency operations from harmful interference. The Commission cited three principle requirements pertaining to interference protection: (i) an off-axis EIRP mask and associated conditions; (ii) pointing accuracy requirements; and (iii) cessation of transmission requirements if the antenna strays from the intended satellite.¹² NSMA addresses these requirements, as well as other issues, below.

1. Off-Axis EIRP Density Mask

As noted previously, VMESs operate with Ku-band FSS satellite transponders and protect co-frequency FSS operations by limiting their aggregate off-axis EIRP spectral density to levels consistent with two-degree satellite spacing. Thus, from an uplink interference perspective, VMESs appear essentially identical to ESVs and traditional VSAT networks. NSMA supports the application of the off-axis EIRP density mask included in the ESV rules to VMES operations, which is the equivalent of a routinely licensed VSAT antenna compliant with Section 25.209 operating at maximum permissible input power. NSMA understands, however,

¹¹ *Id.* ¶¶ 47-48.

¹² *Id.* ¶ 47.

that the Commission is in the process of modifying certain earth station licensing parameters contained in Part 25 of the Commission's Rules. To maintain regulatory parity among co-primary Ku-band services, it may be appropriate to extend certain rule changes that may be adopted in the Part 25 streamlining proceeding to VMESs.

2. Pointing Accuracy and Cessation of Emissions

In the ESV rules, the Commission linked compliance with the off-axis EIRP density mask with pointing accuracy to protect adjacent satellites from interference. An ESV operating at maximum off-axis EIRP levels (i) must have a pointing accuracy of 0.2 degrees; (ii) must shut down within 100ms if mispointed by 0.5 degrees or more; and (iii) may not resume operations until pointing accuracy within 0.2 degrees from the target satellite.¹³ NSMA agrees that this approach adequately protects adjacent satellites in the VMES context as well.

However, NSMA understands that certain VMES operators propose to operate terminals at off-axis EIRP levels below the mask proposed by the Commission. As a result, these terminals can operate consistent with the permissible mask even when mispointing exceeds 0.2 degrees. In effect, these terminals would produce no more off-axis EIRP than a perfectly pointed VSAT. Accordingly, NSMA believes that the 0.2 degree pointing accuracy requirement may not be necessary for VMES terminals that adequately take mispointing into account and operate at lower power levels.

Similarly, the Commission may wish to consider modifying of the cessation of transmissions requirement to VMES terminals that adequately take pointing accuracy into account. NSMA understands that the requirement to cease transmissions when mispointing reaches 0.5 degrees or greater is imposed to limit the amount of interference in excess of the

¹³ 47 C.F.R. § 25.222(a)(7).

permissible mask produced by a mispointed terminal operating at maximum power. Because VMESs that adequately take pointing error into account would not exceed the permissible mask, the cessation of emissions requirement is not necessary to control the off-axis EIRP density level of such terminals.

The Commission may still wish to impose a specific cessation of emissions requirement on VMES terminals for other reasons. For example, at some level of mispointing it is simply not possible to meet the mask and operate effectively. Furthermore, at some point a VMES terminal would lose satellite lock and become non-functional. While these issues are terminal-specific, it may be possible to establish a maximum mispointing angle beyond which no VMES terminal should be permitted to transmit.

Finally, in applying its pointing accuracy and cessation of emissions rules, the Commission should examine the pointing accuracy tolerance and confidence levels of VMES antenna pointing controls. The Commission should not impose specific values for these factors given the disparate nature of VMES terminal and control system designs. In the context of licensing, however, the Commission should examine VMES antenna pointing tolerances (*i.e.*, range of potential mispointing from calculated pointing direction) and confidence levels (*i.e.*, the accuracy with which pointing direction is calculated) to ensure that adjacent satellite interference will be avoided. Again, these factors are terminal-specific. For example, terminals that seek to operate a maximum off-axis EIRP density levels may be required to demonstrate better pointing accuracy tolerances and confidence levels, while terminals that adequately take pointing error into account conceivably could operate with somewhat lesser standards because they operate at lower power.

3. Other Issues

NSMA generally supports application of other elements of the ESV licensing regime to VMES operations. NSMA comments on certain of those additional elements below.

a. Section 25.209 Antenna Size Threshold

NSMA supports the Commission's proposal not to establish a minimum VMES antenna size, but to grant VMES terminals primary receive antenna protection from FSS space station downlinks only to the extent that the receive antenna complies with the receive antenna protection levels set forth in Sections 25.209(a) and (b) of the Commission's Rules. This approach provides flexibility in VMES terminal design without unduly burdening FSS downlink operations with additional protection requirements.

b. Blanket Licensing

NSMA supports blanket licensing for technically identical VMES terminals. The individual licensing of VMES terminals would be extremely burdensome on applicants and the Commission alike. Indeed, because the terminals are mobile and may be deployed in significant numbers, there is no benefit from requiring individual station licensing.

c. ALSAT Authority

NSMA believes that it is appropriate to grant ALSAT status to VMESs that conform to the licensing requirements for routinely licensed VSATs (*i.e.*, compliance with two-degree spacing policies). This will further ensure regulatory parity among co-primary Ku-band satellite services and provide necessary operational flexibility for VMES licensees. For VMESs that are authorized to operate with different technical characteristics (*e.g.*, at higher power levels), specific satellite points of communication should be designated.

II. CONCLUSION

For the foregoing reasons, NSMA supports the Commission's proposals to establish a licensing and service rules for VMESs, subject to adequately protecting incumbent operations as discussed herein.

Respectfully submitted,

**NATIONAL SPECTRUM MANAGERS
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