

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 Shared
With Terrestrial Fixed Service
IB Docket No. 02-10

NOTICE OF INQUIRY

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By the Commission

I. INTRODUCTION

1. By this Notice of Inquiry (Notice), the Commission solicits comments on a variety of issues related to the authorization of satellite earth stations on board vessels (ESVs). The International Bureau (Bureau) and the Office of Engineering Technology (OET) (jointly, the Bureaus) have granted two companies waivers to operate ESVs and have granted one company Special Temporary Authorities (STAs) with conditions.1 Authorizing ESVs on a more clearly-defined basis, through the adoption of specific rules governing their use, may benefit potential users and service providers by creating regulatory certainty. However, there are existing terrestrial fixed users in some of the bands identified for ESV operations. Consequently, the Commission hopes to solicit comment on potential methods for licensing of 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.

2. In contemplating ESV service, we solicit comments on: (1) the feasibility and wisdom of authorizing ESVs in general, given the Bureaus' previous conditions that ESV stations operating by waiver or STA protect all other authorized services in these bands from harmful interference, (2) the appropriate regulatory status of ESVs, including bands for operation and licensing schemes, (3) methods for dealing with specific interference concerns2; (4) within the context of these matters, the international

1 See Mobile Satellite-Based Communications Services by Crescomm Transmission Services, Inc., and Qualcomm Incorporated, Order, RM-7912 (Int'l Bureau and OET, 1996) (Crescomm Order), 11 FCC Rcd 10944. Qualcomm, Inc. and Crescomm were granted waivers, and Crescomm was subsequently granted a series of STAs. These waivers of Rule 2.106, 47 C.F.R. §2.106, were granted on the condition that ESVs may not cause harmful interference to any other service or operation in the C- and Ku- bands. Crescomm Order at ¶ 13-14.

2 Interference issues include (i) the distance from shore beyond which ESVs would not require interference coordination with terrestrial fixed-service (FS) operations; (ii) the method for addressing interference concerns when inside that distance from shore; and (iii) potential methods for resolving interference issues.

coordination issues that would arise from authorizing ESV operations on a more permanent basis; and (5) other relevant issues that commenters would like the Commission to address in considering how to handle ESV operations.

II. BACKGROUND

3. In December 1991, Crescomm Transmission Services, Inc. (Crescomm) filed a Petition for Rulemaking (*Crescomm Petition*)³ that requested in part to reallocate the fixed-satellite service (FSS) C-band and Ku-band to permit maritime mobile-satellite service (MMSS)⁴ on a co-primary basis and to amend Part 80 of our Rules, which governs Maritime Services, to accommodate this service.⁵

4. At the time of the *Crescomm Petition*, Crescomm provided non-maritime domestic and international communication services through INTELSAT, PanAmSat and other satellite systems in both the C-band and the Ku-band. In the *Crescomm Petition*, Crescomm proposed to provide continuous, two-way video, audio, and high-speed digital communications to ships via satellite. It stated that its system would provide higher capacity and allow more service flexibility, at lower cost to ship-based customers than currently available services.⁶

5. In 1996, the International Bureau and the Office of Engineering Technology issued the *Crescomm Order* and granted rule waivers to Qualcomm, Inc. and Crescomm so that they could provide non-conforming mobile-satellite service (MSS) in frequency bands allocated to FSS and terrestrial fixed-services, including the 6 GHz portion of the C-band.⁷ Crescomm has since changed its name to Maritime Telecommunications Network, Inc. (MTN).

³ *Petition for Rulemaking*, filed December 12, 1991 by Lloyd D. Young of Crescomm Transmission Services, Inc. (*Crescomm Petition*). Qualcomm, Inc. also filed a petition that was addressed in the *Crescomm Order* but not germane to these proceedings.

⁴ MMSS is defined as a “mobile-satellite service in which mobile earth stations are located on board ships.” 47 CFR § 2.1. Mobile satellite service is defined in the International Telecommunication Union (ITU) Radio Regulations as “a radiocommunication service between mobile earth stations and one or more space stations, or between space stations used by this service; or between mobile earth stations by means of one or more space stations.”

⁵ For purposes of this Notice, “C-band” denotes the 3700-4200 MHz (4 GHz portion) and 5925-6425 MHz (6 GHz portion) frequency bands; the “Ku-band” denotes the 11.7–12.2 GHz (12 GHz portion) and 14.0-14.5 (14 GHz portion) frequency bands. In the United States, the C-band is allocated on a co-primary basis to the terrestrial Fixed Service and the FSS. Within the Fixed Service, the band is used for both commercial and private operational microwave communications. Within the FSS, the 4 GHz portion of the C-band is used for space-to-Earth (downlink) applications, and the 6 GHz portion is used for Earth-to-space (uplink) communications. The FSS also operates in the Ku-band. The 12 GHz portion of the Ku-band is used for space-to-Earth (downlink), and the 14 GHz portion is used for Earth-to-space (uplink) communications, primarily to geostationary-orbit satellites. The Ku-band is allocated on a primary basis to FSS, but the lower portion of the band (12 GHz) is also allocated on a secondary basis to the Mobile (except aeronautical mobile) Service. The 14.0-14.2 GHz portion is allocated to the Radionavigation Service on a co-primary basis with FSS. The 14.3-14.4 GHz portion is allocated to the FSS and, in different areas of the world, to the Fixed Service, Mobile Service (except aeronautical mobile), and Radionavigation Service (on a secondary basis).

⁶ *Crescomm Petition* at ¶ 5.

⁷ *Crescomm Order* at ¶ 9. Because the satellite uplink is in the 6 GHz portion of the C-band, there is potential for causing interference from ESVs into terrestrial services in this band. Further, MSS is not allocated internationally in the C- and Ku-bands but is allocated on a secondary basis in the 14.0-14.5 GHz band; however, in the United States it is only allocated to the land mobile-satellite service, also on a secondary basis.

6. The *Crescomm Order* placed conditions on the waivers: first, ESV stations were required to protect all other authorized services in these bands from harmful interference and were required to accept interference from all other authorized service in these bands.⁸ The Bureaus stressed this non-interference condition. The Bureaus further noted that the mobile nature of the ESV stations makes it extremely difficult to prevent harmful interference and to identify the interference source.⁹ The Bureaus also noted that the fixed services carry public and private business communications and could not tolerate harmful interference from MSS earth stations.¹⁰ Second, the *Crescomm Order* prohibited Crescomm from transmitting in the 6 GHz band within 100 km of land, in order to limit the potential for harmful interference to fixed service operations in the C-band, unless Crescomm has successfully coordinated the transmissions with all affected FS stations.¹¹ Finally, the *Crescomm Order* directed Crescomm to work with the National Spectrum Managers Association (NSMA) and other parties to develop interference assessment and prevention procedures for MSS operations in the 6 GHz band.¹²

7. After the Bureaus adopted the *Crescomm Order*, MTN requested an STA from the Commission to operate earth stations on up to 45 ships for 6 months.¹³ In 1997, the Commission granted an STA to MTN, and granted requests for extensions several times from 1997 to 1999. In January 2000, MTN requested authority to increase the number of ships it served, and asked for an STA for 150 ESVs instead of its existing 45.¹⁴ MTN also requested authority to treat its ESVs as FSS earth stations while the ships carrying those ESVs are in port and stationary.¹⁵

8. At the time of MTN's January 2000 filing, MTN's STA authorized the provision of satellite service on a non-harmful interference basis for up to 45 ships while those ships are (1) more than 100 km from land, (2) in motion to or from one of 17 U.S. seaports,¹⁶ or (3) moored in one of those 17 U.S. seaports.¹⁷

9. The Bureau then discovered that MTN had not placed ESVs exclusively on U.S.-flagged vessels as originally indicated.¹⁸ Rather, MTN had placed ESVs on six U.S.-flagged vessels and on 34

⁸ *Id.* at ¶ 13.

⁹ *Id.* at ¶ 11.

¹⁰ *Id.* at ¶ 10.

¹¹ *Id.* at ¶ 11.

¹² *Id.* at ¶ 11 and n.20. The discussions with NSMA did not yield agreement. ESV proponents and elements of the fixed service community have been working within the NSMA for a period of time in an attempt to establish a framework for coordinating the use of ESVs near coasts and in motion approaching harbors. Although these efforts were unsuccessful, a critical contour (or "composite area") method, as described in ¶¶ 27-29 below, has been suggested within NSMA, but not agreed upon.

¹³ Letter from Robert G. Allen, Counsel for MTN, to Donald H. Gips, Chief, Int'l Bureau (dated June 28, 1996). See also *Maritime Telecommunications Network, Inc.*, Order, 15 FCC Rcd 23210, 23212 (¶ 4) (Int'l Bureau, 2000) (*MTN Order*). See also *Maritime Telecommunications Network, Inc.*, Order on Reconsideration, 16 FCC Rcd. 11615 (Int'l Bureau, 2000) (*MTN Reconsideration Order*).

¹⁴ *MTN Order* at ¶ 5.

¹⁵ *Id.* at ¶¶ 5-6.

¹⁶ The 17 seaports in which MTN has been authorized by STA to operate its ESVs on a non-interference basis are as follows: Bremerton, WA; Everett, WA; Ft. Lauderdale, FL; Juneau, AK; Ketchikan, AK; Key West, FL; Los Angeles, CA; Mayport Naval Base in Jacksonville, FL; Miami, FL; New Orleans, LA; Norfolk, VA; Port Canaveral, FL; San Diego, CA; San Juan, PR; Skagway, AK; St. Thomas, VI; Tampa, FL.

¹⁷ *MTN Order* at ¶ 4.

¹⁸ *Id.* at ¶ 4.

foreign vessels.¹⁹ Accordingly, the Bureau did not grant the STA extension as it had in the past, but granted MTN a limited extension so that MTN could continue to operate earth stations only on the six U.S.-registered ships on a non-harmful interference basis.²⁰ The Bureau denied MTN's requested extension of the STA for earth stations on the 34 foreign-registered ships because the Bureau lacked authority to do so.²¹ The Bureau also denied MTN's FSS applications because the Bureau found that MTN's earth stations should be licensed as temporary fixed earth stations rather than regular or permanent earth stations.²²

10. In its July, 2001 request for an STA, MTN asked for authority to operate 10 ESVs in the C-band and Ku-band. C-band use was requested on a non-interference basis for all operations more than 100 km from shore.²³ MTN also asked for authority to operate in the C-band on a non-interference basis for all operations while docked at and traveling to and from the 17 authorized ports until such time that operations of the ESVs could be converted to the Ku-band. The Commission granted this STA request for 60 days on July 18, 2001. The STA allows operation of ESVs on ten U.S.-flagged vessels, with the following limitations if the ESV is using the C-band: (1) the vessel must be 100 km from shore, and (2) if the vessel is going to or leaving one of the 17 seaports mentioned above, the authorization is on a transitional basis until Ku-band antennas can be installed. If the ESV is using the Ku-band, there are no such limitations. As was previously done, the STA was granted on a non-harmful interference basis. MTN has since requested renewal of this STA, and the International Bureau granted it in September 2001.²⁴

11. ESV issues are being considered in the international arena because of frequency coordination matters. Since ESVs may be located on ships that bear flags of different countries and may dock in other countries' ports, ESV service in or near these ports would require bilateral or international frequency coordination in bands where there are terrestrial services in order to ensure protection of these services.

12. The World Radiocommunication Conference in Istanbul in 2000 (WRC-2000) adopted Resolution 82 "inviting the ITU-R²⁵ to continue to study, as a matter of urgency, the regulatory, technical, and operational constraints to be applied to ESV operations, ... and, in particular, to determine the appropriate value for the minimum distance from ESV stations beyond which these stations are assumed not to have the potential to cause unacceptable interference to stations of other services of any administration and beyond which no coordination would be required."²⁶ As we consider how to address the issues that could arise in the potential licensing of ESVs on a domestic level, we will note further international developments concerning this service.

¹⁹ *Id.* at ¶ 9.

²⁰ *Id.* at ¶¶ 9-13.

²¹ *Id.* at ¶ 9, *citing* 47 U.S.C. § 306. Section 306 of the Communication Act precludes the Commission from licensing earth stations on ships of foreign registry.

²² *Id.* at ¶¶ 21-27.

²³ Letter from Eliot J. Greenwald, Counsel for MTN, to Magalie Roman Salas, Secretary, FCC (dated July 6, 2001). This STA was assigned file number SES-STA-20010706-01270.

²⁴ MTN's STA was originally scheduled to expire on November 20, 2001. However, MTN filed a timely request for extension of that STA on November 16, 2001. *See* Application File No. SES-STA-20011116-02185. Accordingly, under the Administrative Procedure Act, MTN's STA will remain in effect until we act on its extension request. *See* Administrative Procedure Act, 5 U.S.C. § 558(c).

²⁵ The International Telecommunication Union's Radiocommunication Bureau.

²⁶ WRC-2000, resolution 82, *resolves* 1.

III. DISCUSSION

13. By this Notice, we explore potential ways that we might allow the authorization of ESVs within our existing regulatory scheme -- rather than extending or creating *ad hoc* STAs -- and allow ESV operation while protecting existing FS operations. However, we undertake this review recognizing that under the current STA and waiver authorizations, ESVs operators are prohibited from causing harmful interference to another lawfully operating radio station and that ESV operators are required to immediately cease operations upon notification of interference.²⁷ Consequently, we seek comment on all aspects of potential licensing, including whether and how such licensing should go forward, and how interference to terrestrial fixed licensees can be mitigated to the greatest extent possible.

A. Examining ESV Licensing

14. The Bureaus have authorized two companies to operate ESVs on a waiver and STA basis since 1996: Crescomm (now known as MTN) and Qualcomm, Inc. Waivers and STAs are usually reserved for special circumstances and are not meant to circumvent normal licensing procedures. In examining the broad associated issues, we seek comment on the necessity of ESV licensing: do services exist that render ESV licensing superfluous? Do ESVs provide services that are unavailable through other means? Could MTN and other companies find other ways to offer similar service? Are there alternatives to ESV licensing, including continuing to grant waivers? We seek comment on any alternatives and whether/why the alternative is preferable to ESV licensing. As ESV service has now been operational in some form for five years, and as MTN seeks to expand the service, we seek general comment on whether the time is ripe for developing rules for licensing ESV service. Lastly, we seek comment on any other issues that commenters deem relevant as we consider the wisdom of advancing ESV licensing.

B. Regulatory Issues

15. We seek comment on all issues pertaining to the regulatory status of ESVs. An initial question to address is: in which bands could ESVs best be accommodated?

1. Appropriate Band For ESV Operation

16. Specifically, we seek comment on the use of compatible and available bands for operation of ESV systems. We seek comment on the ability of bands that are currently allocated for MSS to provide for ESV systems.²⁸ If MSS bands will not adequately provide for this service, we seek comment on which FSS bands should be considered for ESV operation. If we were to determine that ESVs may operate in FSS networks, would we need to modify the Table of Frequency Allocations to accommodate such use (e.g., through a footnote addition)? Although the 1996 *Crescomm Order* described ESVs as providing mobile-satellite service earth stations, the ITU has recognized that ESVs may operate in FSS networks.²⁹

²⁷ *MTN Order* at ¶ 29.

²⁸ We note that another Commission proceeding is considering the use of MSS bands. *In the Matter of Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band*, Notice of Proposed Rulemaking, 6 FCC Rcd 15532 (rel. Aug 17, 2001).

²⁹ WRC-2000, in Resolution 82, notes "that ESV may operate in fixed-satellite service networks... under No. S4.4 of the Radio Regulations and shall not claim protection from, nor cause interference to, other services in the band". S4.4 of the Radio Regulations states "Administrations of the Member States shall not assign to a station any (continued...)"

17. ESV operators have used the C-band to date, and are now beginning to use the Ku-band. Due to the multiple modes of ESV operation, should we allow Ku-band operation of ESVs either as an adjunct to C-band operation or in some cases as a replacement for the C-band? We seek comment on the continued use of C-band and any additional use of Ku-band.

18. ESV operations began in C-band because: (1) these satellite networks can provide broad coverage, that permits ships to communicate from anywhere at sea; and (2) the equipment was readily available. The problem with use of the C-band for ESV operations is that in many countries the band is heavily used by terrestrial microwave systems operating in the FS. As ESVs approach the coast, the potential for interference to FS operations increases, necessitating coordination of ESV use with FS operations so as not to cause interference. Use of the Ku-band in coastal areas is being considered in lieu of coordinating with C-band fixed-service operations. Most countries do not have terrestrial services operating in the satellite uplink portion of the Ku-band and thus coordination may be easier in those areas. The difficulty with using Ku-band is that space station antennas usually provide only spot beam coverage in coastal areas rather than the broader coverage provided in C-band. In this case, for ESVs operating well beyond the coast, communication would be impossible using only Ku-band. We seek comment on use of the Ku-band generally.

19. ESVs could use the Ku-band in a variety of ways. ESVs could operate in a dual-band mode, using both C-band and Ku-band. If dual-band operation were to be adopted and ESVs operate in C-band while operating at sea, then within some previously-defined minimum distance from shore ESVs could switch to the Ku-band. We seek comment on dual-band operation.

20. Additionally, where ESVs serve ships that travel only in an area near the coast, the Ku-band could be used exclusively. For example, if a cruise ship only travels around the Hawaiian islands, it is possible that the more limited footprint of the Ku-band would still cover that ship in all three modes: at port, at sea, and while entering or exiting port. In that case, by operating exclusively in the Ku-band, the ESV operation would not have to be coordinated with terrestrial services since such services do not operate in the Ku-band. We seek comment on whether an ESV on such a limited-range ship could be licensed in the Ku-band instead of the C-band.

2. Appropriate Licensing Approach and Restrictions

21. We seek comment on the appropriate licensing approach and restrictions for potential ESV operations. One method for such licensing could be a special restricted class of earth stations. While we are considering the use of other bands (as discussed above), we seek comment on whether ESV licensing under Part 25 within FSS networks, and with certain restrictions, would be the most appropriate. The bands currently being used, C-band and Ku-band, are allocated to the FSS both domestically and internationally. If we do license ESVs as a special restricted class of earth station, we seek comment on what those restrictions should be. Alternatively, if we were to license ESVs as MSS earth stations, we seek comment on what other regulatory changes would be required? Would it be necessary to change our domestic frequency allocations table to provide a maritime mobile-satellite service allocation at C-band and Ku-band, and would any other changes be required to allow these stations to communicate through existing FSS networks? We further note that the Bureau considered ESV dockside operations in January 2000 and June 2001 and concluded that because ESVs would be operating only intermittently, the service

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frequency in derogation of either the Table of Frequency allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the constitution, the Convention and these Regulations.”

would be better classified as a temporary-fixed service.³⁰ We request further comment on the appropriate licensing of dockside operations of ESVs.

22. Other regulatory issues include potential conditions on ESV licenses. One possible restriction might be continuing the condition contained in the current STA and waiver authorizations prohibiting ESV operations from causing harmful interference to any entity operating in conformance with the Table of Frequency Allocations. In other words, if licensed, all ESV operations would be required to cease immediately upon notification of unacceptable interference being caused to a fixed service station. We seek comment on this potential condition, and on whether all ESV operators should be required to forward any complaints of radio interference to the Commission immediately, in writing. Additionally, we seek comment on whether it would be appropriate for the Commission to impose additional obligations on the FSS earth stations that provide the gateway facilities for ESVs to ensure that ESV transmissions that cause unacceptable interference are immediately terminated, whether those ESV stations are U.S.-licensed or foreign-licensed. We ask if we should adopt any additional rules that would allow us to take punitive action against FSS gateway facilities that provide service to ESV stations (whether foreign or domestic) that repeatedly cause unacceptable interference to fixed service stations.³¹ If so, what standard of proof should we meet if and when it seeks to impose such sanctions on FSS gateway facility operators? What standard of proof should be required of interested parties requesting that we impose such standards? How could we coordinate with foreign-licensed vessels?

23. We note that in February 1997, MTN was granted an STA to operate its ESVs on a non-harmful interference basis when the ships it served were in or near one of four U.S. seaports.³² More recently, MTN was authorized to provide ESV service in motion to or from one of 17 U.S. seaports.³³ We seek comment on whether the Commission should continue to allow in-motion operations in the future. Alternatively, would the potential for interference be significantly reduced by limiting ESV operations only to "in or near" U.S. seaports as initially authorized. If so, how would this affect the services currently provided by ESVs.

24. Other possible restrictions that could be placed on ESV licensees include: specifying a minimum antenna elevation angle (e.g. coordination to a specific satellite), specifying a minimum antenna diameter and maximum half-power antenna beamwidth, and also specifying the antenna tracking accuracy required for the ESV operation.³⁴ We could also require that ESV applicants specify the minimum amount of spectrum needed to perform the necessary service and that they limit the maximum ESV transmitter power.³⁵ This would result in greater spectrum efficiency and a decreased potential for interference in bands where coordination with terrestrial services would be necessary. Additionally, the ESV licenses could be limited to a term of 1 to 3 years so that ESV operation could be closely monitored

³⁰ *Order on Reconsideration and Memorandum Opinion and Order*, DA 01-1283 (Int'l Bureau, released June 5, 2001).

³¹ For existing FCC rules, see Sections 25.273(a)(3) (prohibiting operations that cause harmful interference) and 25.160(b) (license termination for "malicious" causing of interference).

³² Letter from Steve Sharkey, Chief, Satellite Engineering Branch, Satellite and Radiocommunication Division, International Bureau, to Robert G. Allen, Counsel for MTN (dated Feb. 13, 1997).

³³ See *Supra* para. 8.

³⁴ For example, in Annex 2 to Res. 82, the provisional technical guidelines state that the minimum elevation angle of an ESV antenna is 10⁰, the minimum ESV antenna diameter is 2.4 m, and the ESV antenna tracking accuracy is 0.2⁰. See also *Draft New Recommendation, ITU-R.SF* [4-9S/ESV-B].

³⁵ The provisional technical guidelines contained in Annex 2 to Res. 82, also state that the maximum necessary bandwidth per vessel is 2.346 megahertz, the maximum necessary bandwidth in a single operating area is 36 megahertz, and the maximum ESV transmitter power spectral density at the input to the antenna is 17 dB(W/MHz).

and, in bands where coordination was necessary, fixed service operational changes could be implemented efficiently. Finally, we seek comment on a requirement that ESV services be limited to receive-only. While we recognize that such a restriction may limit somewhat the commercial appeal of the ESV service, a receive-only restriction would virtually eliminate the interference issues that are of such concern, particularly in the C-band. We would like to develop a record on the pros and cons of a receive-only restriction. We seek comment on these or other potential special restrictions.

25. We also seek comment on coordination issues. Ultimately, our preference is to prevent interference before it occurs. Under usual coordination procedures for FSS, the entire C-band is coordinated. Similarly, the entire visible geostationary satellite orbital arc is generally coordinated. ESVs, however, use considerably less than a full band. Therefore, ESVs could be coordinated to specific satellites, which would limit their azimuth and commensurately limit the portion of the visible arc they would use. We seek comment on use of this special method of coordination and on any other regulatory issues that we should consider going forward.

C. Interference Issues

1. Determining the Distance From Shore Beyond Which Unacceptable Interference Should Not Be Possible

26. If ESV licensing goes forward, determining the distance from shore outside of which interference from ESVs to FS operations will not occur (Distance From Shore) would be critical to successful ESV/FS coordination. We seek comment on the appropriate Distance From Shore. A Distance From Shore of 200 km may be suggested for two reasons.³⁶ The current practice of the frequency coordinators requires a search of up to 125 statute miles radius (approx. 200 km) around the proposed location of a new FSS earth station to ascertain if there is potential for interference. This method has been effective for more than twenty years, preventing interference to FS from FSS. The U.S. has presented to ITU-R Working Party 4-9S a series of calculations that suggest that a distance as low as 165 km might be adequate as a coordination distance.³⁷ Increasing the Distance From Shore from 165 km to 200 km would provide an added degree of protection to FS stations operating in the same band with ESVs, and would be consistent with current domestic procedures for FS-FSS coordination. We seek comment on this rationale, and on other factors, if any, that should be considered in calculating the appropriate Distance From Shore.

2. Coordination of Operation Within a Distance Where Unacceptable Interference Might Occur

27. Once the Distance From Shore is determined, the question remains: how would operations be coordinated inside the Distance From Shore to eliminate unacceptable ESV interference to FS operations but still allow ESV operation inside the Distance From Shore? This determination, in the international context, is being addressed within the ITU-R through the calculation of a Composite Area within which interference to fixed stations from ESVs operating in motion near a coastline need to be

³⁶ As the technical annexes to the Preliminary Draft New Recommendation ITU-R SF [4-9S/ESV-A] illustrate, however, the calculation of a minimum distance from shore depends on a number of assumptions. Based on different values for these assumptions, the results of these studies revealed a range of values for the minimum distance from 100 km to 540 km. The ITU-R WP 4-9S meeting agreed that the minimum distance from shore should be 300 km for operation in the C-band and 125 km for operation in the Ku-band.

³⁷ These calculations were based on the newly modified ITU-R propagation models (Rec. P.620 and Rec. P.465) using assumptions about system characteristics (such as bandwidth, power spectral density, and antenna performance), as well as assumptions about ship movements (such as speed and number of passes per annum).

evaluated.³⁸ We seek comment on whether the use of the Composite Area calculations could also serve as the basis to determine this area in a domestic context. Commenters should address whether this method examines all of the factors relevant to determining the potential for interference to fixed stations by ESVs. We seek comment on whether the use of the Composite Area to address concerns about interference within the Distance From Shore is sufficient, or whether other factors must be considered.

28. To determine the Composite Area, one needs to know the position of the vessel as it proceeds toward or away from shore, enters and exits a port or harbor, and proceeds to or from the vessel's stationary point at dock.³⁹ Based on maritime navigation regulations, the extremes of position for all larger vessels, including those equipped with ESVs, are defined according to the sea lanes and port channels that ships use to approach or depart from a port.⁴⁰ These extremes of position (that is, the administration-mandated limits of permissible vessel motion which are clearly designated on maritime charts) define the "operating contour" for all larger vessels operating in a particular port or harbor.⁴¹ Identification of this mandatory operating contour, which cannot be violated by any vessel, provides the basis for determining the Composite Area within which coordination with fixed stations needs to take place.

29. In addition, it is necessary to identify a set of break points along the operating contour representing the limits of vessel position and where the sea-lanes and port channels change direction. The coordination areas computed for each break point can be drawn on a chart containing the relevant operating contour or generated by a computerized graphical information system using the same principles. We seek comment on this two-stage process for calculating the Composite Area. We also seek comment on, in general, the Composite Area method for evaluating the potential for interference to fixed stations from ESVs, as well as any other factors that should be considered. Finally, we seek comment on any alternatives to the Composite Area method for evaluating the potential for interference.

3. Prevention and Resolution of Interference

30. We also seek general comment on how to handle anticipated interference issues. We are particularly interested in comments on whether the operation of existing MTN systems has in fact caused interference to other operations.⁴² The *Crescomm Order* states that "[t]he mobile nature of the MSS stations makes it extremely difficult to prevent interference and to identify the interference source."⁴³ Further, the fixed community has stated in an *ex parte* statement that interference from a moving ship is all but impossible to trace⁴⁴ and that in-motion operations have not been adequately coordinated as

³⁸ *Draft New Recommendation ITU-R.SF [4-9S/ESV-B]*.

³⁹ The determination of the Composite Area is defined more specifically as follows: it is carried out in two stages. The first is the determination of a set of areas at specific points within the ship's operating contour as described above. The second is the development of the Composite Area from these individual point areas, or a representative set of positions in or on the operating contour. These are the individual point areas. These individual areas are developed by determining the required coordination distance at a set of azimuth angles. These individual points can be computed using the minimum permissible transmission loss methodology contained in Recommendation ITU-R SM.1448

⁴⁰ *Draft New Recommendation ITU-R.SF [4-9S/ESV-B]*.

⁴¹ *Id.*

⁴² We note that at least one complaint of alleged interference by MTN has been filed by the Fixed Wireless Communications Coalition (FWCC) (Letter from Mitchell Lazarus, Counsel for FWCC to Eliot J. Greenwald, Counsel for MTN (dated May 1, 2001).

⁴³ *Crescomm Order* at ¶ 11.

⁴⁴ Letter from Mitchell Lazarus, Counsel for the Fixed Wireless Communications Coalition, to Eliot Greenwood, Esq. (dated May 1, 2001) at 2.

required.⁴⁵ We believe that if we license ESVs, flexible, efficient and continuous coordination would be the key component to ensuring that ESVs do not cause unacceptable interference to FS stations. In order to ensure this coordination truly is successful, it would be necessary for all parties to be able to identify the ESVs that may be coming into a given port in order to effectuate such coordination, including the precise routes and schedules used by these vessels. One approach to facilitating information exchange could be a requirement for both the ESV operators and coastal administrations to keep a publicly available list of all ESVs that have been licensed or otherwise granted authority to operate in their area. It also may facilitate communication if the harbormaster is provided this information. We seek comment on requiring real-time location tracking and that more timely information be made available (e.g., on the Internet). For example, we note that there are many tracking devices commercially available that provide very precise location based on GPS tracking. We seek comment on the feasibility and adequacy of these possible measures to ensure proper coordination.

31. Other approaches to providing the information necessary to ensure that ESVs do not cause unacceptable interference to the FS include: first, that ESV licenses indicate the name of the ESV operator and a point of contact, as well as the name of the vessel and a method by which to contact the ship directly (for instance, the ship's Inmarsat number); second, the license could list the frequencies that have been cleared for use by that ESV; and third, a website with all information on licensed ESVs could be created for the purpose of such coordination. Thus, if there were any interference reported, all parties would have information to quickly identify its source by contacting the coastal administration, the harbormaster, a website, or the ESV operator. If the ESV were a non-primary licensee, the ESV station would be required to cease operation immediately if it causes interference. We seek comment on these ideas for information exchange. In this regard, we seek comment on whether we should require an ESV system to include a means of identification and automatic mechanisms to terminate transmissions whenever the ESV operates outside its operational limits or is identified as the source of interference. How can we enforce the requirements for preventing and resolving unacceptable interference? We seek comment on these and other ideas to exchange information, to prevent unacceptable interference, and to resolve interference issues should they arise.

32. Shorter license terms might also be an incentive for ESV operators to assist with the resolution of interference complaints, in that if an ESV station was reported to be interfering on a regular basis and was being in any way uncooperative with the FS station licensee, the ESV license may not be renewed. We seek comment on the appropriateness of a 1-3 year license term. The shorter terms might provide incentive for ESV operators to carefully coordinate their arrival and at-port use with FS stations. We seek comment on the concept of shorter licensing terms and other issues related to coordination.

IV. CONCLUSION

33. We seek comment on the possibility of licensing ESV operations on U.S.-registered ships while protecting existing and future FS operations. In considering these matters, we seek comment on the wisdom of ESV licensing, on related regulatory and interference issues, and other matters relevant to domestic licensing of ESV operations.

⁴⁵ *In the Matter of Maritime Telecommunications Network, Inc. Application for Special Temporary Authority*, Order, DA-1300 (Int'l Bureau, rel. Sept. 29, 2000) at n. 33, citing Petitions submitted by the Association of American Railroads, the Consortium Digital Microwave System, the American Petroleum Institute, the Fixed-Wireless Communications Coalition, the Association of Public-Safety Communications Officials-International, Inc., UTC, and the County of Los Angeles.

V. PROCEDURAL MATTERS

A. Ex Parte Presentations

34. This is a permit-but-disclose Notice of Inquiry. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided that they are disclosed as provided in Commission rules.

B. Deadlines and Instructions for Filing Comments

35. Under Sections 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on this *Notice of Inquiry* on or before [Insert 30 days after publication in the Federal Register] and reply comments are due on or before [Insert 60 days after publication in the Federal Register]. Interested parties may file comments by using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies.⁴⁶ The Commission will consider all relevant and timely comments prior to taking final action in this proceeding. To file formally, interested parties must file an original and four copies of all comments, reply comments, and supporting comments. If interested parties want each Commissioner to receive a personal copy of their comments, they must file an original plus nine copies. Interested parties should send comments and reply comments to the Office of the Secretary, Federal Communications Commission, 445 12th Street, S.W., Washington, D.C. 20554. Parties not filing via ECFS are also encouraged to file a copy of all pleadings on a 3.5-inch diskette in Word 97 format.

36. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Generally, only one copy of an electronic submission must be filed. In completing the transmittal screen, commenters should include their full name, Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To receive filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message: "get form <your e-mail address.>" A sample form and directions will be sent in reply.

37. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Acting Secretary, William F. Caton, Office of the Secretary, Federal Communications Commission, 445 12th Street, S.W., Washington, D.C. 20554.

38. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, 445 12th Street, S.W., Washington, D.C. 20554. Comments are also available on the ECFS, at https://gullfoss2.fcc.gov/cgi-bin/websql/prod/ecfs/comsrch_v2.htm.

⁴⁶ See *Electronic Filing of Documents in Rulemaking Proceedings*, Memorandum Opinion and Order, 13 FCC Rcd 21,517 (1998); *Electronic Filing of Documents in Rulemaking Proceedings*, Report and Order, 13 FCC Rcd 11,322 (1998).

IV. ORDERING CLAUSES

39. Accordingly, **IT IS ORDERED** that pursuant to the authority contained in Sections 1, 4(i), 4(j), 7(a), 301, 303(c), 303(f), 303(g), 303(r), 303(y), and 308 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154(i), 154(j), 157(a), 301, 303(c), 303(f), 303(g), 303(r), 303(y), 308, this *Notice of Inquiry* **IS ADOPTED**.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary