

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Wireless Telecommunications Bureau Seeks ) RM-11765  
Comment on Radio Technical Commission )  
For Maritime Services Petition for Rulemaking )  
To Update Part 80 of the Commission's Rules )

**REPLY COMMENTS OF MOTOROLA SOLUTIONS, INC.**

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Motorola Solutions, Inc. (“MSI”) hereby replies to the comments filed in connection with the Federal Communications Commission’s (“FCC” or “Commission”) *Public Notice*<sup>1</sup> regarding the Radio Technical Commission for Maritime Services (“RTCM”) Petition for Rulemaking requesting that the FCC launch a notice of proposed rulemaking (“NPRM”) to update and streamline Part 80 of its rules.<sup>2</sup>

**I. INTRODUCTION AND SUMMARY**

In considering its options for updating the Part 80 rules through an NPRM, the Commission should be guided by its long-standing policy objectives to promote: (1) the deployment of spectrum to meet public safety needs, and (2) the efficient utilization of scarce spectrum. Accordingly, the Commission should decline to propose the rule change requested by RTCM that would have the effect of calculating the radiation center of an antenna as the height above mean sea level (“RC-AMSL”) rather than the effective antenna height (“EAH”), as to do

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<sup>1</sup> Public Notice, “Wireless Telecommunications Bureau Seeks Comment On Radio Technical Commission For Maritime Services Petition for Rulemaking to Update Part 80 of the Commission’s Rules,” RM-11765, DA 16-398 (rel. Apr. 14, 2016) (“*Public Notice*”). As discussed below, MSI holds a number of licenses issued under Part 80 of Commission’s rules to support non-maritime, public safety and private land mobile operations and therefore has an interest in this proceeding.

<sup>2</sup> Petition of the Radio Technical Commission for Maritime Services for Rulemaking, RM-11765 (filed Feb. 16, 2016) (“*Petition*”).

so would require public safety and other licensees to reduce significantly the effective radiated power (“ERP”) of their operations and, thus, adversely impair the reliability of communications critical to support their activities. In addition, the Commission should ensure that any changes it proposes to the Part 80 rules in an NPRM reflect policies and standards it has adopted to accommodate non-maritime, land mobile operations. Last, the FCC should confirm that any rule changes that cross-reference the standards and regulations of non-FCC entities do not improperly restrict the ability of the Commission and interested parties to review and comment on how those materials should be applied or limited in the context of FCC-licensed operations.

## **II. THE NPRM SHOULD NOT PROPOSE TO UTILIZE RC-AMSL RATHER THAN EAH TO CALCULATE PROPAGATION**

In its current form, Section 80.763 of the Commission’s rules provides that the EAH “is the vertical distance between the center of the radiating system above the mean sea level and the average terrain elevation.” RTCM has recommended revising this provision to state that “[t]he effective height of the antenna is the vertical distance of the center of the radiating system above the mean water or sea level.” RTCM also proposes deleting the companion Section 80.759 setting forth the method for calculating average terrain elevation.

MSI joins MariTEL, Inc. (“MariTEL”) in opposing RTCM’s recommended revisions to Sections 80.763 and 80.759. As described in greater detail below, employing an RC-AMSL approach would overstate the propagation characteristics of licensee systems and, as a result, would not only have an adverse impact on current and future licensed operations, but also diminish opportunities for efficient spectrum channel reuse. Moreover, RTCM’s recommendation is inconsistent with how propagation is traditionally calculated in the Commission’s rules governing other services and operations.

**A. An RC-AMSL Approach Significantly Overstates Propagation Characteristics**

RTCM's recommendation to delete Section 80.759 and to change Section 80.763 would essentially require an entity to calculate the field strength of its operations based upon the RC-AMSL rather than EAH. RTCM states that while average terrain elevation is "useful in calculating propagation over land," it is "not useful in calculating propagation over a waterway and leads to erroneous results."<sup>3</sup>

Contrary to RTCM's statements, its recommended approach would overstate the propagation characteristics of licensee operations by significantly increasing the propagation distances determined in accordance with the tables set forth in Section 80.767 of the Commission's rules. In a recent case that highlights this issue, Riverside County in California, sought to enhance its public safety communications to cover dead spots in mountainous terrain by installing a base station, among other sites, at Elsinore Peak (33-36-8N; -117-20-37W) with an average terrain elevation at 270 degrees of 2031 feet and an EAH of 1611 feet.<sup>4</sup> That request was opposed because of claims that the proposed operations would create an interference contour extending 200 miles or more, based on calculations using a RC-AMSL of 3642 feet rather than the EAH.<sup>5</sup> Using the current EAH methodology, which considered the shielding effect of surrounding terrain, MSI calculated that the interference contour would extend offshore by less

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<sup>3</sup> *Id.*

<sup>4</sup> *See* Riverside, County of, Application for Partial Assignment, ULS File No. 0003743672, filed May 19, 2009.

<sup>5</sup> *Id.* (Letter from Joseph D. Hersey, Jr., Chief, Spectrum Management, United States Coast Guard, to Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, dated July 30, 2009, at 7 (attached to Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius Knapp, Chief, Office of Engineering and Technology, FCC, dated August 4, 2009).

than 55 miles, a 145 mile disparity.<sup>6</sup> As discussed below, an overstatement of the magnitude illustrated by the Riverside County example based upon an RC-AMSL approach would have a detrimental impact on the operations of existing and future licensees and significantly reduce opportunities to utilize spectrum efficiently.

**B. An RC-AMSL Approach Is Inconsistent with FCC Precedent**

RTCM's proposed change is also inconsistent with the Commission's traditional approach for determining propagation. In its original form, the EAH provision of the Commission's rules was adopted in 1972 as Section 81.806.<sup>7</sup> At the time of adoption, the Commission signaled that it was concerned with capturing an antenna's full natural surroundings when calculating its effective height.<sup>8</sup> The Commission distinguished between scenarios where "terrain [would] not [be] a factor" and scenarios where "terrain [would be] a factor."<sup>9</sup> While the Commission noted that near the water "intervening terrain or manmade structure(s)" may not impact effective antenna height, it acknowledged that those kinds of land masses should be accounted for.<sup>10</sup> In 1986, the Commission streamlined its Part 81 rules "without change," moving the regulations to Part 80 where the effective antenna height provision was codified in

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<sup>6</sup> *Id.* (Opposition of Motorola, Inc., filed August 28, 2009. Opposition of Motorola, Inc.; *see also id.* (Request to Supplement Record, filed by Motorola, Inc., on April 12, 2010).

<sup>7</sup> *See Part 81 – Stations On Land in the Maritime Services and Alaska – Public Fixed*, Report & Order, 37 Fed. Reg. 11328, 11332-33 (1972). The old Section 81.806 was intended to contain the same methodology for calculating effective antenna height as Section 80.763 does today.

<sup>8</sup> *See id.* at 11332.

<sup>9</sup> *Id.*

<sup>10</sup> *See id.*

today's Section 80.763.<sup>11</sup> By doing so, the Commission reaffirmed its commitment to using the EAH method for calculating propagation in the maritime services.

More importantly, the methodology set forth in Part 80 was intended to resolve differences in opinion about the use of various alternatives, which likely would have included an option similar to the RC-AMSL approach. Specifically, the FCC stated:

A wide variety of articles and papers have been prepared over the years on the subject of propagation at very high frequencies, however, we know of none which have been universally accepted for use in all areas of the country. Nonetheless, it is necessary that propagation data be included in the rules to provide means for the uniform computation of coast station coverage. While we readily concur that the propagation data should be as accurate as possible, we doubt that 100 percent endorsement can be obtained for any particular method. As between (a) a high degree of accuracy of the propagation data, and (b) inclusion in the rules of a method for uniformity in computation, we are of the view that the latter is more germane to this proceeding and, therefore, is the more important.<sup>12</sup>

In fact, the method the Commission adopted in Part 80 is similar to those set forth in other Commission rules for calculating propagation characteristics. Notably, the Commission's Broadcast Radio Service rules calculate antenna height and predict coverage based on height above average terrain ("HAAT").<sup>13</sup> Likewise, the rules for Public Mobile Services in Part 22 determine effective radiated power limits based on the height above average terrain of the base transmitter antenna.<sup>14</sup> The limits on power levels and antenna heights in Part 90 governing Public Safety and Business operations also rely on calculations based upon HAAT.<sup>15</sup> Taken

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<sup>11</sup> See generally *Reorganization and Revision of Parts 81 and 83 of the Rules to Provide a New Part 80 Governing the Maritime Radio Services*, Report & Order, FCC 86-141 (1986).

<sup>12</sup> Technical Standards for Computation of Service Area for Public Coast III-B Stations, Report and Order, 37 Fed. Reg. 11328, 11329, ¶ 9 (June 7, 1972).

<sup>13</sup> See 47 C.F.R. § 73.313(d).

<sup>14</sup> See *id.* § 22.659(b).

<sup>15</sup> See *id.* § 90.729(b).

together, these provisions reflect the Commission's long-standing endorsement of a methodology that considers height above average terrain as does the current EAH methodology. RTCM has not shown why the Commission should depart from prior precedent and adopt the RC-AMSL method. Without a strong showing of support for the departure from well-established Commission precedent, MSI believes that the Commission should decline to propose RTCM's recommendation in any NPRM it initiates in this proceeding.

**C. An RC-AMSL Approach Would Adversely Affect Licensee Operations**

More importantly, employing an RC-AMSL approach would have a significant adverse impact on service reliability and spectrum efficiency. As noted above, the RC-AMSL approach would overstate field strength calculations and, as a result, expand the non-interference restrictions of existing and future licensees. For example, the Commission has prescribed specific co-channel interference protection obligations codified in Section 80.773 of the Commission's rules.<sup>16</sup> That Section requires operators to meet the following requirements:

- (a) Where a VHF public coast station geographic area licensee shares a frequency with an incumbent VHF public coast station licensee, the ratio of desired to undesired signal strengths must be at least 12 dB within the service area of the station.
- (b) Where a VHF public coast station geographic area licensee shares a frequency with an incumbent private land mobile radio licensee, the VHF public coast station geographic area licensee must provide at least 10 dB protection to the PMLR incumbent's predicted 38 dBu signal level contour. The PMLR incumbent's predicted 38 dBu signal level contour is calculated using the F(50, 50) field strength chart for Channels 7-13 in § 73.699 (Fig. a0) of this chapter, with a 9 dB correction factor for antenna height differential, and is based on the licensee's authorized effective radiated power and antenna height-above-average-terrain.
- (c) VHF public coast station geographic area licensees are prohibited from exceeding a field strength of 5 dBu (decibels referenced to 1 microvolt per meter) at their service area boundaries, unless all the affected VHF public coast station geographic area licensees agree to the higher field strength.

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<sup>16</sup> *Id.* § 80.773.

In addition, certain operators are required to ensure that the field strength of their operations does not exceed +5 dBu at the shoreline.<sup>17</sup>

Applying RC-AMSL rather than EAH to determine propagation characteristics would result in finding a number of licensees to be operating at a field strength greater than the permissible limits. Accordingly, these licensees would be required to reduce the ERP of their operations to comply with the Commission's rules, which would adversely impact service quality and reliability. Alternatively, these licensees could be required to seek waivers of the FCC's rules, which would impose substantial administrative burdens on the agency, especially if such waivers were challenged. Further, future operators may be precluded from even commencing certain operations because of the expanded non-interference obligations. Such an outcome would clearly undermine the Commission's primary goals of supporting the communications needs of the public safety community and promoting spectrum efficiency.<sup>18</sup>

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<sup>17</sup> See *Motorola, Inc.*, Order, 22 FCC Rcd 579 (WTB 2007). Rather than propose an RC-AMSL method in an NPRM, the FCC should instead seek comment regarding whether to increase the field strength level in Section 80.773(c), as that limit is much stricter than the comparable requirements (*e.g.*, 19 dBu, 21 dBu) associated with services governed by other Parts of the FCC's rules and does not take into account actual desired to undesired signal strengths as set forth in subsections (a) and (b).

<sup>18</sup> See generally *State of Florida, Request for Waiver of the Commission's Rules to Permit Licensing of Stations in 800 MHz General Category on Non-standard Channel Centers*, Memorandum Opinion and Order, 16 FCC Rcd. 2174 ¶ 13 (2001) ("*Florida Waiver Order*"). Indeed, Section 1 of the Communications Act lists as one of the core purposes of the FCC to "promot[e] safety of life and property through the use of wire and radio communication. 47 U.S.C. § 151. Further, the Commission has stated that the events of September 11, 2001 "reinforce the critical nature of the public safety community's responsibilities to our Nation's safety and well-being. Access to modern wireless communications is essential to ensuring that the public safety community can effectively fulfill these responsibilities." *The 4.9 GHz Band Transferred from Federal Government Use*, Second Report and Order and Further Notice of Proposed Rule Making, 7 FCC Rcd. 3955, 3967 ¶ 23 (2002) ("*Second 4.9 GHz Order*").

### **III. ANY RULE CHANGES PROPOSED IN AN NPRM SHOULD ACCOMMODATE EXISTING LICENSEE OPERATIONS AND SUPPORT NON-MARITIME, LAND MOBILE USE**

Comments in this proceeding have suggested that the Commission amend Part 80 to allow stations operating in the mobile satellite service (“MSS”) (Earth-to-space) to use frequencies allocated for Automatic Identification Systems (“AIS”) and Application-Specific Messages (“ASM”) applications, consistent with the current footnotes to the table of frequency allocations.<sup>19</sup> In particular, comments have expressed support for allowing stations in the MSS to use the following AIS and ASM frequencies, as appropriate: 161.975 MHz (AIS 1), 162.025 MHz (AIS 2), 161.950 MHz (ASM 1), 162.000 MHz (ASM 2), 156.775 MHz, and 156.825 MHz.<sup>20</sup>

MSI notes that MSS operations on some of these channels could impact existing licensees that hold authorizations to operate on the VHF Public Coast (“VPC”) channels. To the extent the Commission proposes to implement any amendments to the rules that would impact the use of these channels, it should ensure that current licensee operations are protected or accommodated.<sup>21</sup> Moreover, consistent with the Final Acts of WRC-15, World Radiocommunication Conference, the Commission should avoid imposing any additional constraints on existing users or services on either co-channels or adjacent frequency bands.<sup>22</sup>

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<sup>19</sup> Comments of Iridium Communications, Inc., RM-11765, at 2 (May 31, 2016).

<sup>20</sup> *Id.*

<sup>21</sup> See, e.g., *Amendment of the Commission’s Rules Regarding Maritime Automatic Identification Systems*, Second Report and Order, WT Docket No. 04-344, 23 FCC Rcd 13711, 13716-22 ¶¶ 8-16 (2008), *erratum*, 24 FCC Rcd 3241 (2009) (The FCC designated maritime VHF Channel 87B (161.975 MHz) for exclusive use by maritime Automatic Identification Systems (“AIS”) in the thirty-three inland VHF Public Coast (“VPC”) service areas (“VPCsAs”) and provided a framework and timetable for clearing Channel 87B of non-AIS operations in the inland VPCsAs).

<sup>22</sup> International Telecommunication Union, Final Acts WRC-15 World Radiocommunication Conference (Geneva, 2015), at Appendix 18, available at <http://www.itu.int/pub/R-ACT-WRC.12-2015/en>; see also Recommendation ITU-R M.2092.

Instead, the Commission should promote the efficient use of the VHF maritime spectrum and seek to accommodate all users.

As noted above, MSI notes that it acquired from MarITEL, Inc., and various other VPC licensees approximately 200 kHz VPC spectrum so that MSI could support non-maritime, public safety and private land mobile operations in geographic areas not near the coastlines or the major navigable waterways.<sup>23</sup> MSI explained that its proposal would, among other things:

- Free a significant amount of spectrum in the highly demanded 150 MHz band to support public safety, homeland security, and other essential state and local government activities throughout most of the United States.
- Ensure that essential public health and safety personnel have access to effective and interoperable communications services.
- Further the efficient and flexible use of VPC spectrum that might otherwise remain unused by allowing MSI to assist entities with replacing outdated and antiquated analog systems with state-of-the-art systems that support innovative and comprehensive data and voice capabilities.
- Would facilitate the construction and deployment of Public Coast operations along the nation's coastal areas and in navigable waterways.
- Would not affect deployment of the maritime Automatic Identification System ("AIS") by the United States Coast Guard ("Coast Guard" or "USCG").

Alternative, terrestrial land mobile uses of VPC spectrum have been an unqualified success for a number of entities, including: (1) the states of South Dakota, Wyoming, Missouri, and the Commonwealth of Virginia; and (2) the counties of Placer and Riverside in California; (2) the counties of Northumberland and Columbia in Pennsylvania; (3) the City of Woodway in Texas; (4) the counties of Essex and Sullivan in New York; and (5) utilities in Kentucky, to

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<sup>23</sup> *Motorola, Inc., Application for Consent to Partition and Disaggregate Licenses and Requests for Waiver of Part 80 Rules to Permit Use of Maritime Frequencies for Private Land Mobile Radio Communications*, 22 FCC Rcd 579 (WTB MD 2007).

name only a few.<sup>24</sup> Motorola is also actively engaged in rolling out VPC spectrum for proposed systems in other areas.

For example, South Dakota used VPC spectrum to construct the nation's first statewide digital, narrowband trunked VHF network which, according to the state, "allows personnel from all federal, state and local levels to use existing radio systems to communicate in the interest of public safety."<sup>25</sup> As a consequence of these achievements, the State was awarded top ranking by the Public Safety Wireless Network ("PAWN"), a joint initiative of the Justice and Treasury Departments, for interconnecting communications for statewide public safety.<sup>26</sup> Similarly, the Commonwealth of Virginia's Statewide Agencies Radio System ("STARS") uses VPC channels to provide the Virginia State Police and twenty other Virginia agencies with the ability for the first time to communicate directly with one another. The STARS system replaced the existing analog system with a VHF digital high-band system that integrates voice and data communications and can support five times the number of users than the prior system.

Virginia's interoperability efforts have already been recognized by the Department of Homeland

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<sup>24</sup> See *Wireless Telecommunications Bureau Assignment of Authorization and Transfer of Control Applications Action*, FCC File No. 0001132016, Public Notice, Report No. 1411 (rel. Feb. 5, 2003) (consenting to assignment from MariTEL to the State of South Dakota); *Commonwealth of Virginia, Request for Waiver of Part 80 Rules to Permit Use of Maritime Frequencies for Private Land Mobile Radio Communications, Applications for Assignment of 150 MHz Marine Channels to the Commonwealth of Virginia*, Order, 19 FCC Rcd 15454 (WTB PSCI Div. 2004); *County of Placer, California, Warren C. Havens, and MariTEL Southern Pacific, Inc., Request for Waiver of Part 80 Rules to Permit Use of Maritime Frequencies for Private Land Mobile Communications, Requests for Waivers of Section 80.773 of Rules Regarding Signal Strength*, Order, 20 FCC Rcd 3657 (2005). See also Universal Licensing System ("ULS") File Nos. 0001132016 (Riverside County, CA), 0003976849 and 0004029237 (East Kentucky Power Cooperative, Inc.); 0004266263 (Essex County, NY), 0004655402 and 0005183145 (Sullivan County, NY); 0004835315 (State of Missouri), 0005600579 (Woodway, TX), 0005904547 (Northumberland County, PA), and 0006637147 (Columbia County, PA).

<sup>25</sup> See Press Release, BIT News, South Dakota Earns Top Ranking in Homeland Security Effort (Apr. 25, 2003).

<sup>26</sup> *Id.*

Security's SAFECO, the federal entity charged with improving radio communication among first responders nationwide, as a best practices model.

Should the Commission propose any changes to the rules that would impact such channels, it should ensure that current licensee operations are protected or accommodated. Moreover, MSI also encourages the agency to include in any rule revisions certain additional changes that would offer licensees greater operational flexibility to enhance the functionality and capacity of their systems and to reflect the policies and standards adopted in various Commission decisions and practices that facilitate land mobile use of these channels to support public safety and other land mobile communications. Specifically, MSI recommends incorporating the following policies into the rules to be proposed in the Commission's forthcoming NPRM for public safety licensees using channels in the 156-162 MHz band allocated under Section 80.371 of the Commission's rules to support non-maritime, land mobile operations:

- An exemption from the requirements in Section 80.371 to support public correspondence communications.
- Authority to deploy mobiles with a transmitter output power of up to 50 watts, consistent with rules governing Part 22 and Part 90 channels that may be incorporated into their systems.<sup>27</sup>
- Flexibility to operate on certain channels on a simplex basis and on a mobile-to-mobile basis.<sup>28</sup>

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<sup>27</sup> See, e.g., *State of Missouri, Request for Waiver of Part 80 Power Limits for Public Safety Land Mobile Operations on Maritime Frequencies*, FCC File No. 0004835315, WT Docket No. 12-133, Order, DA 13-100 (rel. Jan. 25, 2013 – Mob. Div., WTB). Section 80.215 currently limits the transmitter power to 25 watts.

<sup>28</sup> Compare Section 80.123 (requiring land mobile stations to communicate only with fixed stations).

#### **IV. THE COMMISSION SHOULD ONLY INCORPORATE REFERENCES TO SPECIFIC STANDARDS WITH CLEARLY MARKED DATES AND VERSION NUMBERS**

MSI agrees with RTCM that the Part 80 rules are riddled with references to technical standards, many of which are listed in Section 80.7.<sup>29</sup> RTCM's Petition recommends several updates to various standards listed in Section 80.7, including deleting several duplicative standards that are encompassed in other references.<sup>30</sup> The Petition explains that the suggested edits are designed to "allow updating of all standards referenced in Part 80 to be accomplished in this section only."<sup>31</sup> Further, the Petition notes that the proposed revisions are "intended to simplify the rulemaking process necessary whenever the standards incorporated in this Part are routinely updated by their respective standards organizations, and to enable these references to be kept up to date."<sup>32</sup> With this reasoning, RTCM implies that its revisions are designed to allow the Commission to incorporate automatically new standards versions into its rules by reference.<sup>33</sup>

Importantly, RTCM's proposed edits continue to reference dated or otherwise numbered versions of specific standards. Consistent with the Federal Register's rules for incorporations by reference, updates should not include vague references to undated or unnumbered publications.<sup>34</sup> RTCM also does not propose to change the provisions in Section 80.7 that require the

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<sup>29</sup> 47 C.F.R. § 80.7.

<sup>30</sup> *See id.* at Attachment 23-34.

<sup>31</sup> *Petition* at 3.

<sup>32</sup> *Id.*

<sup>33</sup> *See* MariTEL Comments at 2 (opposing "any action that would automatically adopt as FCC rule actions taken by standards bodies that may not be aligned with U.S. spectrum policy.").

<sup>34</sup> *See* 1 C.F.R. § 51.1(f). The Federal Register's rules for incorporation by reference limit incorporation to "the edition of the publication that is approved. Future amendments or revisions of the publication are not included." *Id.*

Commission to “publish notice of the change in the Federal Register” and make the material available to the public before it may enforce a technical standard “other than” the version specified.<sup>35</sup>

While MSI appreciates the need to ensure technical standards cited in the rules keep pace with updates issued by standards-setting organizations, the Commission should emphasize in the NPRM that it still intends to provide adequate notice and a meaningful opportunity for interested parties to comment before new versions of technical standards are incorporated into the rules by reference, including those RTCM has identified in its Petition. The plain terms of Section 80.7 acknowledge the importance of the notice-and-comment process, mandating that the Commission publish notice of changes in the Federal Register and make the proposed materials available to the public.<sup>36</sup>

## **V. CONCLUSION**

MSI appreciates the opportunity to respond to comments submitted in connection with RTCM’s Petition recommending revisions to Part 80 of the Commission’s rules. While MSI generally agrees with the effort to streamline, simplify, and modernize the Commission’s rules for maritime services, the Commission should not implement the RC-AMSL approach to calculating propagation. The Commission should also ensure that any changes it proposes to the Part 80 rules in an NPRM reflect policies and standards it has adopted to accommodate non-maritime, land mobile operations. Last, the Commission should ensure that technical standards that are incorporated into Part 80 by reference are easily identifiable by date or version number and ensure that interested parties are provided notice and an opportunity to comment on future

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<sup>35</sup> *Id.* § 80.7(a).

<sup>36</sup> 47 C.F.R. § 80.7.

updates. MSI maintains that the recommendations outlined in these reply comments will allow the Commission to promote innovative land mobile uses needed for public safety and other operations that complement maritime services while also advancing long-standing Commission objectives to encourage efficient and flexible spectrum use.

Respectfully submitted,

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