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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite ("GMPCS") Memorandum of Understanding and Arrangements	)	IB Docket No. 99-67
	)	
Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emissions Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band	)	RM No. 9165

To: The Commission

REPLY COMMENTS OF THE U.S. GPS INDUSTRY COUNCIL

THE U.S. GPS INDUSTRY COUNCIL

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July 21, 1999

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SUMMARY

The U.S. GPS Industry Council ("the Council"), by its attorneys, hereby replies to various comments filed regarding the Commission's notice of proposed rulemaking ("*NPRM*") in the above-captioned proceeding. In this proceeding, the Commission is proposing limits for out-of-band emissions into the 1559-1605 MHz band from mobile earth terminals ("METs") operating with 1-3 GHz mobile-satellite service ("MSS") systems. The 1559-1605 MHz band is used by Radionavigation-Satellite Service ("RNSS") systems such as the U.S. Global Positioning System ("GPS"), which has millions of users worldwide in a wide variety of safety and non-safety related applications.

In these Reply Comments, the Council shows that there is strong support for permitting the –70 dBW/MHz OOBE level to apply only to 1-3 GHz MSS METs and for requiring case-by-case studies for other applications. This support is provided, *inter alia*, by RTCA. RCTA's strong support for the Council's proposals in this proceeding is significant, particularly in light of RCTA's pivotal role in the initial the development of the –70 dBW/MHz level — *i.e.*, the very same broadband noise level that the National Telecommunications and Information Administration ("NTIA") in turn is recommending in this proceeding.

The Council next clarifies that where commenters in this proceeding have taken positions that are inconsistent with the Council's, these positions have been largely based on the assumption of a lack of studies to demonstrate that GPS receivers require protection to levels below –70 dBW/MHz. The Council emphasizes herein that there are now valid studies, based on actual tests, that are part of the record in this proceeding and

that clearly demonstrate the need for more stringent emission levels in the absence of independent, case-by-case studies.

With respect to MSS METs already in operation, some commenters proposed the grandfathering of such terminals under the assumption that less severe limits than the ones proposed in the *NPRM* would adequately protect GPS receivers. But, as stated below, it is now clear that more stringent levels — not less — are required. Any terminal providing OOBE at levels greater than -70 dBW/MHz will, without a doubt, harm GPS. Accordingly, the Commission must not allow the grandfathering of terminals as such approach would jeopardize GPS safety-of-life applications.

The Council also points to the Commission the fact that a substantial number of commenters advocate in their comments the adoption of more stringent levels to protect GPS receivers. These comments are without foundation, and are countered by the Council's own demonstration to the contrary. Moreover, the Council reiterates that it demonstrated in its Comments that aggregate OOBE levels not exceeding –100 dBW/MHz in the GPS band would appear to provide the requisite measure of protection of GPS receivers from collocated emitters. Other, less stringent levels (albeit never higher than -70 dBW/MHz) may be able to be established on a case-by-case basis where the particular studies consider the operational characteristics, interservice and intraservice aggregate interference levels, and the impact of harmonic emissions, separation distances, and shielding are taken into account.

In these Reply Comments, the Council also emphasizes that the Commission must address all studies submitted during the comment phase of this proceeding and cannot hide under the notion that the OOBE levels proposed in the *NPRM* are only for the

protection of aeronautical uses of GPS. The fact remains, as stated in the Council's Comments and these Reply Comments, that the protection requirements for GPS have to extend to all of safety applications of GPS, be they marine or land, and not just aviation-safety applications associated with GPS. The OOBE levels proposed in the *NPRM* would result in interference to GPS in all other situations where the conditions assumed in the NTIA scenario do not exist, irrespective of whether the affected GPS receiver is supporting an aeronautical, marine or land application.

Accordingly, the Council requests in these Reply Comments that the Commission reject the NTIA proposed limits for all cases other than application of the −70 dBW/MHz wideband/−80 dBW/MHz narrowband OOBE level at 1559-1605 MHz to 1-3 GHz MSS METs. For other cases, the Commission should establish a default OOBE threshold of −100 dBW/MHz, and require case-by-case studies that may, if appropriate, allow a level between −100 dBW/MHz and −70 dBW/MHz to apply to particular emitters based on the relevant factors as outlined in the Council's Comments and these Reply Comments. This is the only approach that is consistent with the Commission's, the President's, and the Congress's interests in protecting the millions of GPS safety-of-life applications.

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To: The Commission

REPLY COMMENTS OF THE U.S. GPS INDUSTRY COUNCIL

The U.S. GPS Industry Council ("the Council"), by its attorneys and pursuant to Sections 1.415 and 1.419 of the Commission's rules,[1] hereby replies to various comments filed regarding the Commission's notice of proposed rule making in the above captioned proceeding.[2]

I. INTRODUCTION

As the Commission reviews the many pleadings submitted in connection with its proposals in this proceeding, the Council urges it to keep in mind that the Council

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1 47 C.F.R. §§ 1.415 and 1.419.

2 *Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite ("GMPCS") Memorandum of Understanding and Arrangements; Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emissions Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band*, IB Docket No. 99-67 (RM No. 9165) (FCC 99-37) (released March 5, 1999) ("*NPRM*").

has now clearly demonstrated that the proposed –70 dBW/MHz out-of-band emission ("OOBE") level is not sufficient to protect the Global Positioning System ("GPS"). There may be circumstances where –70 dBW/MHz is appropriate, as acknowledged by the Council in its comments herein.[3] But for all other circumstances, in the absence of case-specific technical verification, the maximum emission level that will protect GPS receivers is –100 dBW/MHz as demonstrated by the studies documented in the Council's Comments. The Commission must also consider the strong support for the argument that, in the absence of specific studies that address the critical factors, as addressed below, the –70 dBW/MHz level on wideband OOBE into the GPS band cannot be extended to emitters other than 1-3 GHz mobile satellite service ("MSS") mobile satellite earth terminals ("METs"), regardless of where in the frequency spectrum such emitters may be located.

Where parties have taken positions in comments that are inconsistent with the Council's, they have based those positions largely on the assumption of a lack of studies to demonstrate that additional protection is necessary to protect GPS service. But now there are studies demonstrating the need for more stringent emission levels in the absence of independent, case-by-case studies, as shown in the Council's Comments. Further, the comments of the RCTA Special Committee 159 ("SC-159")[4] provide strong support for the Council's assertion regarding agreements reached by the Council and the United States to protect GPS and encourage the development of MSS. The instant reply

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[3] *See* Comments of the U.S. GPS Industry Council in IB Docket No. 99-67 (filed June 21, 1999) ("Council Comments" or "Comments").

[4] Comments of the RCTA in IB Docket 99-67 (filed June 18, 1999) ("RCTA Comments").

comments are intended to clarify for the Commission what the Commission should do to protect GPS, demonstrate the critical support for the Council's recommendations, and respond to those commenters that take positions inconsistent with them.

II. DISCUSSION

A. There Is Strong Support For Limiting The –70 dBW/MHz OOBE Level Only to 1-3 GHz MSS Applications And Requiring Case-By-Case Studies For Other Applications.

In its Comments, the Council explained why it has accepted the use of –70 dBW/MHz as an out-of-band emission limit on 1-3 GHz band MSS earth terminals.[5] Although the –70 dBW/MHz limitation would not protect radionavigation-satellite service ("RNSS") receivers operating at 1559-1605 MHz in many applications (safety and otherwise) for which they are used, the Council recognized that there is a complementary relationship between the RNSS and 1-3 GHz MSS that provides MSS operators with the necessary incentives to ensure that their associated earth terminals are operated in a way that protects RNSS receivers from harmful interference.[6] The Council also noted the United States position, which clearly provides that the –70 dBW/MHz limitation (which is reflected in ITU Radiocommunication Assembly ("ITU-R") Recommendation M.1343) may not be applied to any emitters other than MSS METs associated with MSS systems in the 1-3 GHz range until such time as studies have been successfully completed that address critical subjects including the particular operating characteristics, interservice and intraservice aggregate interference levels, the impact of

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[5] *See* Council Comments at 2.

[6] *See id.*

harmonic emissions, separation distances, and shielding.[7] In its comments herein, the RTCA provided strong support for these points.

First, RTCA emphasized that for mobile earth stations operating in the 1626.5-1660.5 MHz band, emission limits of -70/-80 dBW/MHz should apply to the entire 1559-1605 MHz band with no grandfathering or other exceptions.[8] RTCA explained that the -70/80 dBW/MHz emission limits proposed by RTCA SC-159 were calculated under a specific scenario assuming only one interfering emitter at any given time close to an aircraft on final approach (*i.e.*, at a separation of about 100 feet).[9] Further, RTCA stated that as a result of this assumption, and because of the intense pressure from the MSS community to keep the limits as relaxed as possible, the entire Global Navigation Satellite System ("GNSS") interference budget was allocated to this one MSS interference source in the threat zone.[10]

Further, RTCA stressed that the -70/-80 dBW/MHz limits should not be used as universal standards for all emitters (other than "Big LEO" MSS MET's transmitting in the band 1610-1626.5 MHz), either existing, planned, or future.[11] Indeed, RTCA has been concerned that the emission limits prescribed to protect GNSS from harmful interference will be applied in the future to additional emitters which, in

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7 *See id.* (citing ITU-R Document 8D/210, at 2).

8 *See* RCTA Comments at 2.

9 *See id.*

10 *See id.*

11 *See id.*

fact, were not considered when these limits were established.[12] Finally, RTCA expressed the view that the protection of public safety applications requires that newly proposed systems should be examined on a case-by-case basis to ensure that the aggregate interference does not exceed the GNSS interference threshold.[13]

RCTA's support of the Council's position is significant, particularly in light of RTCA's input towards the development of the –70 dBW/MHz level for 1-3 GHz MSS METs. It is also noted that RTCA's membership is diverse and with different interests than those of the Council's (*i.e.*, airline representatives, equipment manufactures, aeronautical research and development firms, government representatives, and users of aviation equipment).[14] RCTA also functions as a Federal Advisory Committee, dealing with aeronautical navigation, communications and other safety-related issues.[15] Further RCTA SC-159 developed an important source document, RTCA/DO-235, which established the foundation for the broadband noise levels that NTIA is in turn proposing in this proceeding.[16]

In short, there is significant and strong support for the point that the –70 dBW/MHz level can only apply to 1-3 GHz MSS applications. The establishment of OOBE levels for other emitters requires comprehensive studies on a case-by-case basis.

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12 *See id.* at 1.

13 *See id.*

14 *See id.*

15 *See id.*

16 *See id.*

B. The Commission Must Protect All Safety-Related Uses Of GPS, Not Just Aeronautical Uses.

Motorola and NTIA support the FCC's proposal not to address marine and land-mobile radionavigation out-of-band emissions in this proceeding.[17] The Council opposes those views, and asserts that there is no rational basis on which the Commission can establish a standard that does not protect all current safety-related uses of GPS.

The Council explained in its Comments that, due to the inherent nature of the safety-related uses of GPS and the constraints imposed by the GPS system specification, the frequency bands used by the GPS must be fully protected against interference from external sources.[18] The Council also explained that contrary to the incomplete expression provided in the *NPRM*, however, this protection requirement extends to all of the safety applications of GPS, be they marine or land, and not just to aviation-safety applications associated with GNSS.[19] The Commission cannot simply state that its purpose is to protect aeronautical uses of GPS and RNSS, ignoring in the process the multitudes of other, non-aeronautical safety-related uses of GPS,[20] in a struthious effort to avoid having to make hard decisions regarding the compatibility of GPS and MSS METs. Neither the fact that that the NTIA OOBE levels were not intended to be applied for the protection of GPS receivers used in non-aeronautical scenarios or even in other aeronautical scenarios, nor the fact that there is no proof

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17 *See* Comments of Motorola in IB Docket No. 99-67, at 2 (filed June 21, 1999) ("Motorola Comments"); Comments of the NTIA in IB Docket No. 99-67, at 29 (filed June 29, 1999) ("NTIA Comments").

18 *See* Council Comments at 28.

19 *See id.*

20 *See NPRM*, FCC 99-37, at ¶ 77.

whatsoever that the NTIA criteria are effective in situations where all three of the conditions above do not exist,[21] absolves the Commission of its responsibility to protect all GPS uses.[22]

C. There Are Now Credible Studies That Have Documented The Inappropriateness Of The –70 dBW/MHz Level To Protect GPS Receivers.

In their comments, Globalstar, L.P. and AirTouch Satellite Service U.S., Inc. (collectively, "Globalstar") asserted that there have been no credible studies demonstrating that more stringent emission standards for MSS METs in the 1610-1626.5 MHz band are necessary.[23] Similarly, Norcom Networks Corporation ("Norcom") noted that even for the recommended NTIA limits, no party supporting NTIA's proposed limits has provided any technical analysis demonstrating the merits of the proposed limits.[24]

These claims, and others like them, have now been dramatically overtaken by events. In its Comments, the Council submitted the methodology and results of a test program that the Council undertook to determine the susceptibility of a variety of RNSS receivers to the effects of interference from various sources, including co-located emitters operating at –70 dBW/MHz into the RNSS bands.[25] The bottom line result from those tests is that under a virtual co-location situation, where the GPS receiver is one meter or

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21 *See* Council Comments at 5-6.

22 Again, the Council emphasizes this point for emitters other than 1-3 GHz MSS METs. OOBE from 1-3 GHz MSS METs, even into non-aviation GPS receivers, is proposed to be addressed in the manner described above.

23 *See* Comments of Globalstar in IB Docket 99-67, at 21 (filed June 21, 1999).

24 *See* Comments of Norcom in IB Docket 99-67, at 7 (filed June 21, 1999).

25 *See id.* at 14-15.

less from the noise source, an OOBE level of –70 dBW/MHz completely prevented the studied receivers from tracking and securing positions fixes from GPS satellites.[26]

The Council's test results were not the only ones. LCS also submitted detailed technical analyses to show why the Commission's proposed limits are inadequate.[27] LSC provided details of different examples of safety-of-life applications of GPS and explained why the proposed emission limits would not adequately protect GPS signals when GPS receivers and MSS terminals are close to each other.[28]

The studies independently provided by the Council and LSC carefully document the tests and analyses, respectively, conducted to demonstrate the inadequacy of the –70 dBW/MHz levels. Therefore, the Council notes that there is no longer any credible opportunity for commenters to argue that the Commission must adopt the –70 dBW/MHz level because there are now valid studies showing why more stringent levels are necessary.[29]

D. The Commission Must Carefully Consider The Studies And Test Results Submitted During the Comment Phase So That The Commission Can Fulfill Its Obligations To Ensure The Protection Of All Uses Of GPS.

In its Comments, the Council has expressed concerns that if the Commission were to adopt its proposed emission standards without considering all the

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26 *See id.* at 15.

27 *See* Comments of LSC in IB Docket 99-67, at 31 (filed June 21.1999) ("LSC Comments").

28 *See* LSC Comments at 14, 31.

29 To the extent that Hughes Network Systems seeks to defer consideration of the narrowband emission limits in the 1559-1605 MHz in the band, the Council opposes this request. *See* Comments of Hughes Network Services in IB Docket No. 99-67, at 1 (filed June 21, 1999). The chief consideration here is protection

operational and technical variations, it would lead to the loss of GPS signal reception or errors in position or time accuracy.[30] In fact, there are numerous commenters that support Commission action to protect GPS receivers, regardless of what specific levels they believe to be appropriate for this purpose.[31] Further, as the Council illustrated in its Comments, there are strong presidential and congressional interests in the availability of GPS.[32] For these reasons, the Council urges the Commission carefully to consider the studies and analyses submitted by the Council and other parties in their comments in this proceeding.

The Council also finds merit in the comments of LSC, which pointed out that the analyses in the Commission's proceedings have not addressed the problem of

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of GPS, not vague concerns of ease of implementation for MSS providers.

30 *See* Council Comments at 8.

31 For example, Aeronautical Radio, Inc. ("ARINC") noted that the aeronautical radio navigation band from 1559 to 1610 MHz must be sufficiently protected from out-of-band emissions if the full benefits of the GNSS are to be realized. *See* Comment of ARINC in IB Docket No. 99-67, at 3 (filed June 21, 1999). Orbital Communications Corporation ("ORBCOMM") believed that it is very important that the Big LEO satellite systems and other L-band MSS satellite systems avoid causing harmful interference to GPS transmissions. *See* Comments of ORBCOMM in IB Docket No. 99-67, at 10 (filed May 3, 1999) ("ORBCOMM Comments"). Motorola, Inc. ("Motorola") believed that RNSS should be protected from out-of-band emissions in the 1559-1610 MHz band, and components of GNSS and GPS should be able to coexist with nearby MSS operations. *See* Motorola Comments at 11. The Boeing Corporation ("Boeing") urged the Commission to ensure that sources of interference are held to the lowest practical level so that the aggregate interference in the GPS band does not degrade the GPS service. *See* Comments of Boeing in IB Docket No. 99-67, at 5 (filed June 21, 1999) ("Boeing Comments"). Constellation Communications, Inc. ("Constellation") urged the Commission to retain the flexibility to extend the less stringent interim limits if they prove sufficient to protect aeronautical radionavigation satellite service ("RNSS") receivers. *See* Comments of Constellation in IB Docket No. 99-67, at 2 (filed June 21, 1999) ("Constellation Comments").

32 *See* Council Comments at 9.

GMPCS out-of-band power aggregation due to multiple handsets.[33] In fact, LSC believes that in the presence of multiple handsets, GPS jam out range increases significantly.[34] If the Commission is to make a reasoned decision as to what level or levels to require to protect GPS receivers, the Commission must carefully review the associated studies provided during this proceeding, which document and demonstrate the reasons as to why the Commission's proposed levels are not adequate to protect GPS systems.

E. Aside From The Clear Demonstration That –70 dBW/MHz Level Is Not Appropriate, The Studies Also Demonstrate More Stringent Emission Standards Are Necessary.

A number of the commenters filing in response to the *NPRM* believe that the –70 dBW/MHz level is not sufficient to protect GPS receivers, and in fact proposed more stringent protection limits. RCTA recommended that the aggregate emission levels from all anticipated new services (other than MSS METs in the 1610-1660 MHz band) should be at least 10 dB below the MSS levels (*i.e.*, -80/-90 dBW/MHz).[35] LSC recommended an additional 13 dB of protection above the proposed -70/-80 dBW/MHz limits.[36] Although Boeing did not take a position at this time on the NTIA proposed limit of -70 dBW/MHz, it urged the Commission to ensure that sources of interference are held to the lowest practical level so that the aggregate interference in the GPS band does not degrade the GPS service.[37] Even NTIA recommended a limit for carrier-off transmitters

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33 *See* LSC Comments at 2.

34 *See id.*

35 *See* RCTA Comments at 3.

36 *See* LSC Comments at 4.

37 *See* Boeing Comments at 5.

that is 10 dB lower than the carrier-on limit to account for a cumulative power effect.[38] And Rockwell Collins, Inc. ("Rockwell") recommended that the emission standards should be -87 and -97 dBW/MHz for out-of-band emitters other than when there is one assumed Big LEO terminal in the vicinity of the GPS receiver.[39]

All of these views support the Council's demonstration that a lower limit than –70 dBW/MHz is warranted.[40] Based on actual tests, the Council noted that aggregate OOBE levels not exceeding –100 dBW/MHz in the GPS band would appear to provide the requisite protection of GPS receivers from collocated emitters.[41]

The Council recognizes in these reply comments that the OOBE level recommended in its Comments is lower than the ones recommended by other parties above – but two points must be kept in mind in this regard. First, as explained in the Council's Comments, an emission standard that takes into account the co-location of METs with GPS receivers is essential because the ubiquity of GPS receivers and the broad variety of GPS applications.[42] Under such co-location scenario, the emission level is –100 dBW/MHz. The commenters above urging a lower than the –70 standard, however, do not consider such co-location scenario. Second, as the Council reiterated in its Comments, the –100 dBW/MHz level is a conservative, default value, and in no way precludes the establishment of OOBE levels that may be as high as –70 dBW/MHz in

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38 *See* NTIA Comments at 22.

39 *See* Comments of Rockwell in IB Docket No. 99-67, at 4-5 (filed June 21, 1999).

40 *See* Council Comments at 17, 29.

41 *See id.*

42 *See id.* at 27.

cases where the specific, credible studies have been conducted considering all the relevant factors, including the particular operational characteristics, interservice and intraservice aggregate interference levels, and the impact of harmonic emissions, separations distances, and shielding.[43] This last point is consistent with the comments of RTCA, which believed that the protection of public safety applications requires that newly proposed systems should be examined on a case-by-case basis to ensure that the aggregate interference does not exceed the GNSS interference threshold.[44]

In short, and in the absence of credible studies that consider all the required factors, the OOBE level should be –100 dBW/MHz. It is possible that a less stringent level — no higher than the –70 dBW/MHz level that is justifiable under very unique circumstances for 1-3 GHz MSS METs — may be able to be established once such studies are conducted. By contrast, the Commission must disregard those comments that claim, without foundation, that the proposed limits are too stringent.[45] As demonstrated in the Council's Comments and supported by numerous parties in their comments, more stringent limits are in fact required.

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43 *See id.* at 29.

44 *See* RCTA Comments at 1.

45 *See, e.g.*, Constellation Comments at 11; Comments of AMSC Subsidiary Corporation in IB Docket 99-67, at 8 (filed June 21, 1999). Constellation, for example, merely refers back to a six-year old rulemaking proceeding, and offers nothing new. *See* Constellation Comments at 11-12.

F. The Commission Should Not Grandfather Non-Compliant GMPCS Terminals.

In their comments, several parties have urged the Commission to grandfather terminals already operating in conjunction with licensed GMPCS systems.[46] But as it did in its initial Comments, the Council urges the Commission not to grandfather such terminals because the GMPCS–related recommendation in the ITU-R does not provide for grandfathering of non-compliant MSS terminals.[47] Indeed, RCTA made clear this point in its comments herein.[48]

Inmarsat supports the *NPRM's* proposal to grandfather terminals already operating in conjunction with licensed GMPCS systems in "recognition" that some GMPCS systems came into operation before the GMPCS Arrangements were formulated.[49] But, as an initial matter, the order as to what took place first – the GMPCS Arrangements or the operation of Inmarsat – is irrelevant here. The question here is not whether Inmarsat became operational prior to the establishment of OOBE limits. Such approach cannot be the criterion for the protection of a GPS system that supports millions of users in safety-of-life applications. The criterion to use is the protection of GPS.

Further, Inmarsat's proposal to the grandfathering of terminals seems to arise also from the belief that less severe limits than the ones proposed in the *NPRM*

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46 *See, e.g.,* Comments of Inmarsat in IB Docket No. 99-67, at 2 (filed June 21, 1999) ("Inmarsat Comments"); ORBCOMM Comments at 5.

47 *See* Council Comments at 23.

48 *See* RCTA Comments at 2.

49 *See* Inmarsat Comments at 7.

would adequately protect GPS.[50] This is an incorrect assumption, as numerous commenters such as the Council and RTCA have now shown.[51]

Inmarsat also supports the grandfathering of GMPCS terminals because of the "difficulty of recalling or retrofitting such terminals would be insurmountable."[52] In this respect, the Council reiterates that any rational balancing of public interest considerations mandates that the Commission must protect the millions of GPS receivers in use today in dozens of safety-of-life applications.[53]

Finally, Inmarsat asserts that terminals with directional antennas will have reduced emissions in the overhead direction as some antennas point to a geostationary satellite – thus those antennas will not cause interference in excess of the permissible levels in RTCA/DO-235.[54] This assertion ignores the usage patterns of GPS receivers (*i.e.*, they are not just aeronautical).

Further, the Council notes that Inmarsat undermines its own arguments for grandfathering of terminals. While stating why its terminals would exceed the proposed emission limits, Inmarsat recognizes that where Inmarsat antennas operate at the equator to a geostationary satellite directly overhead, the operating emissions levels increase.[55] Additionally, Inmarsat also recognizes that in some cases Inmarsat antennas would

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50 *See id.* at 5.

51 *See supra* notes 5-16, 31, and 35-45 and accompanying text.

52 Inmarsat Comments at 7.

53 *See* Council Comments at 21.

54 *See* Inmarsat Comments at 8.

55 *See id.* at 8.

exceed even the *NPRM* proposed limits.[56] The Commission must consider these admissions carefully and as evidence of the great risk that grandfathered terminals pose to GPS. Inmarsat cannot be permitted to operate terminals at emission levels beyond the limits that are required to protect GPS. The Commission cannot allow any increase in noise – whether temporary or permanent – that would pose a threat to the GPS frequency bands. As such, the Commission's proposal to grandfather non-compliant terminals must not be adopted.

G. Technical Standards For 1-3 GHz MSS METs Should Not Be Extended To Other Services Without Separate Study.

The Council explained above the reasons as to why technical standards for 1-3 MHz MSS METs should not be extended to other services without separate study.[57] In this regard, in its comments, Teledesic LLC ("Teledesic"), a proponent of a future non-geostationary satellite orbit ("NGSO") Fixed-Satellite Service ("FSS") system, proposed that the final rules of the *NPRM* proceeding also apply to NGSO FSS terminals.[58] Similarly, SkyBrigde L.L.C. ("SkyBridge"), another proponent of NGSO FSS systems, believes that the rules to be adopted in this proceeding should apply to all satellite systems.[59] But neither Teledesic nor SkyBridge demonstrates that the OOBE limits proposed in the *NPRM* would be sufficient to protect GPS receivers from emissions from NGSO FSS terminals.

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[56] *See id.* at 9.

[57] *See supra* Section A at 3-6.

[58] *See* Comments of Teledesic in IB Docket No. 99-67, at 12 (filed June 21, 1999).

[59] *See* Comments of SkyBridge in IB Docket No. 99-67, at 3 (filed June 21, 1999).

To reemphasize what the Council has said in its Comments and these Reply Comments, the emission levels proposed in the *NPRM* cannot be extended without independent verification to any service other than 1-3 MSS METs because those levels were developed for a particular aviation scenario.[60] The Commission must require case-by-case studies that address the specific operational characteristics and other relevant factors, as stated above, and the impact on the aggregate noise floor in the GPS frequency band.[61] The only alternative — and one which may be viable for operations that are as far removed in frequency as the Ku-band and Ka-band NGSO FSS operations would be — is to meet an OOBE level of –100 dBW/MHz in the GPS bands. For such reasons, the Commission must reject Teledesic's and SkyBridge's proposals to apply the OOBE emissions rules, as proposed in the *NRPM*, to NGSO FSS terminals.

III. CONCLUSION

For foregoing reasons, and as explained in detail in the Council's initial Comments, the Council urges the Commission to reject the OOBE standards that have been recommended by NTIA, other than the final limits that would apply to MSS METs in the 1-3 MHz bands. The Council has demonstrated that the –70 dBW/MHz limit is not adequate as a general default level, in that it is by no means a "protection criteria" for GPS. The Commission should consider these studies carefully.

On the other hand, consistent with almost the universal support for the protection of GPS receivers, the Commission must consider the unique requirements of GPS service, and take the appropriate steps to protect GPS receivers from harmful

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60 *See supra* Sections A and B at 3-7.

61 *See supra* Section A at 3-6.

interference. The Commission should either establish a default OOBE threshold of –100 dBW/MHz or require case-by-case studies that may, as appropriate, allow a higher OOBE level for particular emitters (but in no case higher than –70 dBW/MHz for wideband emissions and –80 dBW/MHz for narrowband emissions) based on the relevant factors as outlined in the Council's Comments and these Reply Comments. This approach is consistent with Presidential and Congressional concerns, with the recent studies and demonstrations of the Council, and the interests of the parties involved in this proceeding, and is essential for the protection of the millions of GPS safety-of-life applications.

Respectfully submitted,

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July 21, 1999

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