Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Commission Staff Requests That Interested	)	WT Docket No. 07-293
Parties Supplement the Record on Draft	)	
Interference Rules for Wireless Communications	)	IB Docket No. 95-91
Service and Satellite Digital Audio Radio Service	)	GEN Docket No. 90-357
	)	RM No. 8610

To: Secretary, Federal Communications Commission

COMMENTS OF GE HEALTHCARE

Neal Seidl
Wireless System Architect
GE Healthcare
8200 W. Tower Avenue
Milwaukee, WI 53223
(414) 362-3413

David Davenport
Electrical Engineer
GE Global Research
1 Research Circle
Niskayuna, NY 12309
(518) 387-5041

Ari Q. Fitzgerald
Hogan & Hartson LLP
555 13th Street, NW
Washington, DC 20004
(202) 637-5423
Counsel to
GE HEALTHCARE

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TABLE OF CONTENTS

INTRODUCTION AND SUMMARY 1

I. PROPOSED COORDINATION DISTANCE FOR WCS BASE STATIONS IS TOO LARGE 2

II. EXISTING UBIQUITOUS DEVICES THAT ARE NOT SUBJECT TO ANY COORDINATION REQUIREMENT ALREADY GENERATE SUBSTANTIALLY HIGHER OOBE INTO THE MAT BAND WITHOUT CAUSING ACTUAL INTERFERENCE TO MAT 5

III. PROPOSED WCS BASE STATION COORDINATION LACKS CLARITY 7

CONCLUSION.....7

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INTRODUCTION AND SUMMARY

GE Healthcare ("GEHC") hereby submits these comments in response to the Federal Communications Commission's ("Commission") request that interested parties supplement the record on draft interference rules for the Wireless Communications Service ("WCS") and Satellite Digital Audio Radio Service ("SDARS").[1]

The Commission has identified WCS as a key element of increasing broadband availability.[2] Over the next 10-15 years, broadband – including wireless broadband such as that which could be provided by WCS – will be an important enabler for new health care services. Examples include facilitating in-home care and patient monitoring, live

[1] *See Commission Staff Requests That Interested Parties Supplement the Record on Draft Interference Rules for Wireless Communications Service and Satellite Digital Audio Radio Service*, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610, Public Notice, DA 10-592 (rel. April 2, 2010) ("*Notice*").

[2] *See* "Connecting America: The National Broadband Plan," Federal Communications Commission (March 2010) at 85-86.

video consultation with remote skilled specialists, new imaging modalities such as highly portable ultrasound, disaster support, and more.[3]

The proposed rules would require a WCS licensee to coordinate the operation of an intended base station with any Mobile Aeronautical Telemetry ("MAT") entity operating a MAT receiver facility within 45 km or radio line of sight, whichever distance is larger.[4] This 45 km coordination distance is unnecessarily large and could stifle significantly the deployment of WCS and broadband services.

The 45 km coordination distance appears to be derived from a worst-case consideration of the radio horizon for a line of sight path assuming WCS base station transmit antenna and MAT receive antennas at a height of 30 meters above ground level. The extremely conservative nature of this proposed coordination distance can be readily appreciated by consideration of the out-of-band emission ("OOBE") limits for unlicensed radio devices as well as the overly conservative power flux density limit proposed by the Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") as protection criteria for MAT operation.

I. PROPOSED COORDINATION DISTANCE FOR WCS BASE STATIONS IS TOO LARGE

AFTRCC cites a power flux density ("PFD") limit of –180 dBW/m^2/4kHz from the ITU-R M.1459 recommendation[5] as necessary to protect MAT systems operating in the S-band. The ITU-R M.1459 recommendation contains numerous cautionary

[3] *See* Comments of GE Healthcare, GN Docket Nos. 09-47, 09-51, and 09-137, WC Docket No. 02-60 (filed Dec. 4, 2009).

[4] *See Notice*, Appendix A, Proposed Rule § 27.73(a).

[5] Recommendation ITU-R M.1459, *Protection Criteria for Telemetry Systems in the Aeronautical Mobile Service and Mitigation Techniques to Facilitate Sharing with Geostationary Broadcasting-Satellite and Mobile-Satellite Services in the Frequency Bands 1 452-1 525 MHz and 2 310- 2 360 MHz*, 2000 ("ITU-R M.1459 Recommendation").

statements as to its potential to yield overly conservative and incorrect conclusions if misapplied.[6] In particular, the M.1459 PFD limit assumes a noise-limited link and is completely inappropriate for interference-limited scenarios, which, as explained in Section II below, is the case in the 2360-2395 MHz MAT band. GEHC has also provided a detailed, statistical analysis of a representative MAT link budget with an aircraft at maximum separation distance as further evidence of the overly conservative nature of this M.1459 PFD limit.[7]

In any event, notwithstanding its overly conservative nature and lack of usefulness in addressing realistic interference scenarios, the M.1459 PFD limit can be used to derive an extreme upper boundary on maximum required separation against which the proposed coordination distance for WCS base stations and MAT receiver operations can be assessed.

The following table, Table 1, lists the proposed OOBE limits for a WCS base station as a function of frequency. Table 1 also lists the distance at which the overly conservative M.1459 PFD limit is reached given free space or terrestrial exponential path loss models (n = 2 or n = 2.4, respectively).

Given terrain and the presence of buildings, it is highly unlikely that free space propagation conditions will occur between WCS base stations and MAT receive antenna sites over distances of 32 km – let alone 126 km. AFTRCC itself has acknowledged that n = 2.4 propagation is a reasonable assumption over such distances.[8] As such, the free space values for 2360 MHz and 2362.5 MHz represent outliers that should be dismissed.

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[6] *See Ex Parte* Comments of GE Healthcare, ET Docket No. 08-59 (filed Feb. 9, 2009) at 17.

[7] *See Ex Parte* Comments of GE Healthcare, ET Docket No. 08-59 (filed Nov. 4, 2009) at A-4.

[8] *See Ex Parte* Comments of Aerospace and Flight Test Radio Coordinating Council, ET Docket No. 06-135 (filed Feb. 4, 2008), Engineering Statement at 6.

Examination of the remaining free space and n = 2.4 terrain calculations shows that the proposed 45 km coordination distance is anywhere from 2.5 to 56.3 times greater than necessary, even starting from the overly conservative and inappropriate M.1459 protection criteria.

Table 1

Frequency [MHz]	WCS Base Station OOBE Limit [dBW]	WCS Base Station OOBE Limit [dBm]	Distance for –180 dBW/m^2/4kHz, path loss exponent = 2.0 [km]	Distance for –180 dBW/m^2/4kHz, path loss exponent = 2.4 [km]
2360.0	-43	-13	126	17.8
2362.5	-55	-25	32	5.7
2365.0	-70	-40	5.6	1.3
2367.5	-72	-42	4.5	1.1
2370.0	-75	-45	3.2	0.8

GEHC has submitted a detailed, probabilistic analysis to determine an appropriate geographic exclusion zone around MAT receive sites that would prevent harmful interference to MAT operations from multiple collocated 0 dBm transmitters.[9] GEHC's analysis shows that modest (*e.g.*, 9.7 km for MAT sites using up to 8-foot parabolic dish antennas) exclusion zones around MAT receive sites would protect MAT operations from harmful interference even under very conservative assumptions.[10] The proposed rules limit WCS base station OOBE to no more than –13 dBm (at 2360 MHz band edge), less than the 0 dBm considered in GEHC's analysis even after adjusting for the 10 dB mean

[9] *See Ex Parte* Comments of GE Healthcare, ET Docket No. 08-59 (filed Sept. 18, 2008), Appendix A at 33.

[10] *See* Comments of GE Healthcare, ET Docket No. 08-59 (filed Oct. 5, 2009) at 15.

building wall loss included in the latter. This suggests that a coordination distance of 10 km would be more than adequate for the coordination of WCS base stations and MAT receive sites.

II. EXISTING UBIQUITOUS DEVICES THAT ARE NOT SUBJECT TO ANY COORDINATION REQUIREMENT ALREADY GENERATE SUBSTANTIALLY HIGHER OOBE INTO THE MAT BAND WITHOUT CAUSING ACTUAL INTERFERENCE TO MAT

GEHC has made detailed filings to the Commission showing that MAT receive operations, especially those close to populated areas, are subject to OOBE from numerous radio sources, including uncoordinated, unlicensed devices.[11] GEHC has documented numerous examples of FCC certification test reports showing typical OOBE measured levels within 1 dB of the OOBE limits across the 2360 to 2390 MHz band.[12] Even the measurements disclosed in filings from Boeing[13] and AFTRCC[14] have shown the presence of such interfering signals. Since these devices are ubiquitous and uncontrolled, the large separation distances that would be required to meet the M.1459 PFD limit (*see* Table 2) are clearly going unsatisfied on a regular basis. The fact that this has not caused problems for MAT proves beyond any doubt that the M.1459 PFD limit is the wrong protection criteria for S-band MAT operations.

It is, therefore, inconsistent to hold WCS base stations to a higher standard than existing ubiquitous and uncontrolled Part 15 and Part 18 devices with respect to absolute

[11] *See Ex Parte* Comments of GE Healthcare, ET Docket No. 08-59 (filed Nov. 7, 2008).

[12] *See Ex Parte* Comments of GE Healthcare, ET Docket No. 08-59 (filed Oct. 30, 2008).

[13] *See* Comments of The Boeing Company, ET Docket No. 08-59 (filed Oct. 5, 2009), Exhibit at 17.

[14] *See* Reply Comments of Aerospace and Flight Test Radio Coordinating Council, ET Docket No. 08-59 (filed Nov. 4, 2009) at Exhibit B. Exhibit B contains ambient signal measurements performed by SAT Corporation that show OOBE signals within 2360-2390 MHz exceeding the thermal noise level by as much as 13 dB. Importantly, these measurements were made with a low gain, omnidirectional antenna rather than a high gain, directional antenna representative of MAT receive operations.

radiated OOBE energy permitted within the 2360 to 2390 MHz band. Table 2 emphasizes this inconsistency by comparing the proposed WCS base station limits to the permitted spurious levels from Part 15, Part 18 and Amateur transmitters.

Table 2

Radio Service	Spurious OOBE Limit [dBm]	Distance for –180 dBW/m^2/4kHz, path loss exponent = 2.4 [km]	Notes
WCS Base Station	*-43 to -75*	*17.8 to 0.8*	*Current proposal, 2360 to 2370 MHz*
Part 15	-21.3	8.1	74 dBuV/m per 1MHz at 3m, peak level within 2360 to 2390 MHz, per 15.209(a) and 15.35(b)
Part 18	-22.7	7.0	25uV/m/MHz at 300m, limit converted according to FCC MP-5 to 4167uV/m/MHz measured at 3m
Amateur	-20	4.3	No absolute limit in rules, but this corresponds to 10W Amateur television assuming excellent –60 dBc OOBE suppression

It is also worth noting that the 2360-2390 MHz band has been used for years – with AFTRCC's knowledge and coordinated approval – for wireless video links to televise major outdoor sporting events. A review of a Broadcast Sports Incorporated ("BSI") filing[15] as well as 29 Special Temporary Authority ("STA") experimental licenses granted to BSI reveals their use of transmit power of 250 mW and 1.5 Watts from airborne (*e.g.*, blimps) and crane-mounted transmitters at a variety of locations

[15] *See* Comments and Counterproposal of Broadcast Sports, Incorporated, ET Docket No. 08-59 (Mar. 4, 2009) at 5.

throughout the Untied States during daytime hours every day of the week on S-band, MAT frequencies.[16]

III. PROPOSED WCS BASE STATION COORDINATION LACKS CLARITY

The proposed requirement that WCS and MAT licensees "cooperate in good faith in the coordination and deployment of WCS and MAT facilities," and that WCS licensees "cooperate in good faith in the selection and use of new station sites and new frequencies when within radio line of site of MAT receiver facilities . . . and make the most effective use of the authorized facilities"[17] lacks clarity with respect to the responsibilities of both parties. The proposal also fails to set a deadline by which coordination must be complete in order to avoid resolution by the government. This lack of clarity and deadline makes it possible for MAT facilities operators to abuse the coordination process and unnecessarily delay WCS base station deployment. If the Commission maintains a coordination requirement, GEHC urges it to provide better guidance to the coordinating parties and set a reasonable deadline for resolution.

CONCLUSION

The proposed rules for WCS base stations define an unnecessarily large coordination distance and OOBE limits that are inconsistent with spurious limits from other, uncontrolled radio transmitter devices. The affected geographic area follows the square of the required coordination distance (radius). Rules that impose a larger-than-necessary coordination radius will encumber significantly more geographic areas than necessary. A factor of 10 times excess in coordination distance impacts 100 times more

[16] *See* Reply Comments of GE Healthcare, ET Docket No. 08-59 (filed Nov. 5, 2009) at Appendix B.

[17] *See Notice*, Appendix A, Proposed Rule § 27.73(b).

geographic area. As a result, an overly conservative and burdensome coordination distance would stifle considerably broadband deployment and hinder the benefits it promises to the American people.

Respectfully submitted,

/s/ Neal Seidl

Neal Seidl
Wireless System Architect
GE Healthcare
8200 W. Tower Avenue
Milwaukee, WI 53223
(414) 362-3413

/s/ David Davenport

David Davenport
Electrical Engineer
GE Global Research
1 Research Circle
Niskayuna, NY 12309
(518) 387-5041

/s/ Ari Q. Fitzgerald

Ari Q. Fitzgerald
Hogan & Hartson LLP
555 13th Street, NW
Washington, DC 20004
(202) 637-5423
Counsel to
GE HEALTHCARE

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