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Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

**Re: GE Healthcare *Ex Parte*
ET Docket No. 08-59**

Dear Ms. Dortch:

GE Healthcare (“GEHC”) takes this opportunity to provide additional clarification regarding certain aspects of its proposal for the creation of a new Medical Body Area Network Service (“MBANS”) in the 2360-2400 MHz band and to briefly address a recent counterproposal filed in this docket by Broadcast Sports, Incorporated (“BSI”).¹

MBANS Eligibility, Permissible Communications and Expected Applications. While one very promising application that would be enabled by the creation of the MBANS is the wireless body sensor network (“BSN”) for patient monitoring, GEHC anticipates that many other short-range, wireless medical device applications would also be spurred by the new allocation. In terms of permissible communications, the MBANS proposed by GEHC would allow for the operation of any wireless medical device that complies with the proposed technical rules and is used by health care professionals for the monitoring, diagnosing or treatment of patients. However, MBANS uses and applications would differ from medical device uses and applications that currently predominate in the WMTS, MedRadio and Part 15 unlicensed bands. WMTS addresses relatively longer-range, less power-constrained applications such as hospital-wide ambulatory telemetry with centralized monitoring stations. MedRadio, on the other hand, addresses lower

¹ See Comments and Counterproposal of Broadcast Sports, Incorporated, ET Docket No. 08-59 (Mar. 4, 2009) (“*BSI Counterproposal*”).

bandwidth, ultra-low-power applications such as programmable implants and percutaneous blood glucose sensors. MBANS would complement these existing services by enabling additional applications, such as BSNs, that require MedRadio-like low-power and short-range communications, but also require WMTS-like data rates. In addition, unlike WMTS devices, MBANS devices would be able to manage spectrum usage and mutual coexistence autonomously, thus enabling more convenient, flexible and widespread usage. Moreover, as GEHC has previously stated, the Part 15 bands are not suited for MBANS applications such as BSNs because the technical rules applicable to Part 15 devices make it too difficult to achieve the reliability needed for unprocessed physiological data monitoring, and the Part 15 bands are already utilized extensively by hospitals for WLAN-related and other applications. In sum, there is a significant need for the MBANS allocation, and the applications that would develop as a result would differ significantly from, and likely complement, the applications that currently make use of existing medical device bands.

GEHC believes that it would be both unnecessary and undesirable for the MBANS rules to attempt to define beyond what has already been proposed by GEHC the specific applications that would be permitted, as any such further definition could unnecessarily restrict the development of innovative new medical applications in the band. Instead, the Commission's MBANS rules should allow medical device manufacturers the flexibility to develop a wide variety of high-bandwidth, low-power applications. Finally, GEHC expects that applications, such as traditional medical telemetry applications that currently operate under the WMTS rules, would not end up migrating to the MBANS under the rules as proposed, as traditional medical telemetry applications would continue to be much better accommodated under the technical rules (*e.g.*, higher emissions limits) applicable to WMTS.

MBANS Spectrum Allocation and Authorized Locations. GEHC's current proposal contains specific revisions to the new Part 95 rules initially proposed in its December 27, 2007 *ex parte* in the MedRadio proceeding² and was described in detail in GEHC's September 18, 2008 *ex parte* in this docket.³ Specifically, under the current GEHC proposal, the MBANS allocation would be divided into a "lower band" and an "upper band" comprising 2360-2390 MHz and 2390-2400 MHz bands, respectively. MBANS operations in the upper band would be permitted anywhere that CB station operation is permitted.⁴ MBANS operations in the lower band would be limited to health care facilities, as defined in Section 95.1103(b) of the FCC's rules,⁵ that are not located within

² See *Ex Parte* of GE Healthcare, ET Docket No. 06-135 (Dec. 27, 2007).

³ See *Ex Parte* of GE Healthcare, ET Docket No. 08-59, at 8 (Sept. 18, 2008) ("*GEHC September 18 Ex Parte*") (proposing that MBANS use of 2360-2390 MHz band be limited to health care facilities located outside of geographic exclusion zones created around all AMT facilities).

⁴ See 47 C.F.R. § 95.405.

⁵ This rule sets forth the definition of "health care facility" in the WMTS rules. The principle effect of adopting the WMTS definition of health care facility versus GEHC's previously-proposed definition is that ambulances would no longer be considered part of

any of the geographic exclusion zones defined to protect aeronautical telemetry receive stations. As a general matter, the proposed exclusion zones would be defined based on a 9.7 kilometer protection radius, which GEHC's coexistence analysis suggests is very conservative,⁶ centered on each AMT receive site.⁷ In some cases, a single, larger exclusion zone could be defined to protect multiple AMT sites that are clustered closely together. As GEHC has previously noted, the actual exclusion zone radius necessary to protect aeronautical mobile telemetry is the primary remaining question to be resolved, and this question is appropriate for treatment as part of a Notice of Proposed Rulemaking ("NPRM").

In view of questions that continue to be raised by the Aerospace & Flight Test Radio Coordinating Council ("AFTRCC") regarding the amount of MBANS spectrum proposed and the specific choice of the 2360-2400 MHz band, a brief explanation of the history of the MBANS proposal may be helpful. In its 2006 response to the Commission's MedRadio Notice of Inquiry ("NOI"), GEHC suggested the need for an allocation of spectrum that was better suited to the unique requirements of BSNs, estimated that 5-10 MHz would be required to be available for BSNs at any given place and time after sharing with other devices and services,⁸ and identified a number of candidate bands for the new allocation.⁹ Over the following year, as part of the development of its detailed MBANS proposal, GEHC performed a closer examination of its spectrum requirements, including considerations for sharing with MBANS applications other than BSNs, peak device densities that could arise at certain locations within hospitals, and more detailed research into contention protocol efficiency. The results of that investigation indicated that the amount of spectrum that would need to be available for MBANS devices at any given place and time should exceed GEHC's original estimate for BSNs alone by a factor of two (*i.e.*, 10-20 MHz). Additional considerations that influenced GEHC's current

a health care facility, and therefore, use of the 2360-2390 MHz lower band would not be permitted in ambulances.

⁶ GEHC September 18 Ex Parte, Appendix A.

⁷ Although GEHC believes that it would be possible in individual cases to ensure that 2360-2390 MHz band MBANS operations inside exclusion zones did not cause harmful interference to aeronautical telemetry, GEHC proposes exclusion, rather than coordination, zones because exclusion zones provide more certainty for aeronautical telemetry interests and are easier to administer. In addition, although health care facilities located inside exclusion zones would be severely constrained in their use of MBANS (*i.e.*, limited to MBANS operations only in the 2390-2400 MHz band), potential MBANS access to even a small amount of spectrum is better than no access at all. Indeed, where less spectrum is available, health care facilities would, obviously, need to prioritize their MBANS operations and make compromises regarding which, and/or in what patient densities, MBANS applications were deployed. This is no different from the challenges that occur today when certain portions of the WMTS band are unavailable. Fortunately, with MBANS exclusion zones would affect only a small minority of health care facilities.

⁸ Reply Comments of GE Healthcare, ET Docket No. 06-135, at 3 (Dec. 4, 2006).

⁹ *Id.* at 7-12.

MBANS spectrum allocation proposal were the capabilities and performance of off-the-shelf electronic components, the properties of the radio channel (*e.g.*, coherence bandwidth, etc.), the nature of incumbent operations in the various candidate bands, and the potential for international harmonization.

These considerations ultimately led GEHC to conclude that allocation of the 2360-2400 MHz band would be the best option. This entire band can be supported by off-the-shelf components with minimal modification, which is key to achieving the economies of scale necessary to make small, low-power, low-cost devices feasible. Moreover, allocation of the entire 40 MHz for MBANS would serve to maximize the likelihood of sufficient spectrum being available at any given location and time for MBANS devices to operate on an opportunistic, secondary basis after sharing with higher power incumbent services and, therefore, would maximize the usefulness and public benefit of the new service.

Coordination and Registration Mechanisms. GEHC believes that the coordination process applicable to the MBANS could be relatively straight-forward. For example, the MBANS rules could require that before the 2360-2390 MHz lower band could be used for MBANS operations,¹⁰ a health care facility would need to contact the designated coordinator, who would then check the facility location against a database of geographic exclusion zones. If the health care facility was not located inside an exclusion zone, then the request would be granted and the facility's location would be entered into an MBANS operations database. If the facility's location was found to be inside an exclusion zone, then the request would be denied and no further action would be necessary.

GEHC believes that the approach taken with WMTS, where a third party was appointed as frequency coordinator¹¹ and WMTS operations were licensed-by-rule, would also be workable for MBANS. However, if the Commission deems it preferable, a "light licensing" approach, whereby an eligible health care facility (*i.e.*, one located outside of all the exclusion zones) could obtain a single blanket license for the use of the lower band, would also be acceptable. Use of the upper band should be licensed-by-rule, requiring no registration or coordination.

¹⁰ GEHC expects that MBANS devices would be designed to operate exclusively in the 2390-2400 MHz upper band by default, requiring deliberate intervention to enable 2360-2390 MHz lower band operation.

¹¹ See, *e.g.*, *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, Report and Order, 15 FCC Rcd 11206 (2000); *Wireless Telecommunications Bureau Opens Filing Window for Requests to Be a Frequency Coordinator in the Wireless Medical Telemetry Service*, Public Notice, 15 FCC Rcd 19038 (WTB PSPWD, 2000); *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, Order, 16 FCC Rcd 4543 (WTB PSPWD, 2001); *Wireless Telecommunications Bureau Announces that the American Society of Health Engineering of the American Hospital Association May Begin Frequency Coordination of WMTS Equipment*, Public Notice, DA 01-952 (WTB: PSPWD, Apr. 17, 2001).

Contention Protocol Requirement. In originally proposing that all MBANS devices be required to employ unrestricted contention-based protocols, as had been defined prior to GEHC’s December 27, 2007 filing in the Commission’s rules for the 3650-3700 MHz band,¹² GEHC’s chief goal was to ensure a basic level of predictable coexistence across a variety of MBANS devices, including those employing dissimilar protocols. However, GEHC recognizes that a wide array of specific techniques (*e.g.*, CSMA / listen-before-talk, Frequency Hopping, ALOHA, etc.) could arguably satisfy such a requirement and that, while allowing considerable flexibility, a relatively open-ended, unrestricted contention-based protocol requirement could pose practical challenges for equipment certification. While GEHC would not favor overly-prescriptive service rules that effectively define a single media access control (“MAC”) protocol for MBANS devices, less subjective approaches than explicitly requiring devices to implement an unrestricted contention protocol could potentially provide a greater level of certainty with respect to the equipment certification process without significantly reducing manufacturer flexibility. For example, a possible alternative to a relatively open-ended unrestricted contention-based protocol requirement would be to define a few basic technical characteristics and parameters for MBANS devices, such as maximum channel bandwidth (which is already incorporated into the MBANS proposal), maximum channel occupancy time, minimum number of hop channels, etc. This topic would also be appropriate for exploration through an NPRM.

BSI Counterproposal. As mentioned above, GEHC takes note of the recent filing in this docket by BSI. Indeed, the filing demonstrates that secondary operations in the 2360-2400 MHz band have been successfully achieved throughout the United States for years. At a minimum, the BSI filing certainly serves to support GEHC’s assertion that the band is very sparsely utilized and is therefore a good candidate for secondary operations.

With respect to BSI’s concern that the creation of the MBANS would preclude it from continued use of the band, GEHC notes that there is currently no allocation in the band for BSI’s operations, and therefore, these operations are not entitled to any protection or continued use of the spectrum. Moreover, in contrast to the societal benefits generated by simplifying the provision of television coverage to golf tournaments, car races, and a small number of other events, the significant societal benefits generated by the establishment of the MBANS – and its potential to enhance greatly the delivery of health care throughout the country – are extremely compelling.

Finally, even if existing services such as the Local Television Transmission Service and Broadcast Auxiliary Service are not adequate to fully accommodate the needs of BSI, many other options besides the 2360-2400 MHz band surely exist. Indeed, BSI’s operations lack the stringent size, cost, and power consumption constraints that limit the number of spectrum bands that are realistically available for the MBANS and make the 2360-2400 MHz band so uniquely well-suited for the new service. Moreover, if the

¹² See *Wireless Operations in the 3650-3700 MHz Band*, Memorandum Opinion and Order, 22 FCC Rcd 10421 ¶ 34 (2007).

advent of high-definition video¹³ is driving the need for additional bandwidth, it would seem appropriate for BSI to leverage newer, more efficient wireless technologies, such as higher-order modulation, as opposed to simply looking for additional spectrum.

Respectfully Submitted,

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¹³ *BSI Counterproposal* at 3 (citing the need for 8-12 MHz channels for high-definition video transmission).