

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

In the Matter of)	
)	
Sensible Medical Innovations)	ET Docket No. 18-39
Request for Waiver of Part 15 of the Com-)	
mission’s Rules Applicable to Ul-)	
tra-Wideband Devices)	

COMMENTS OF THE GPS INNOVATION ALLIANCE

The GPS Innovation Alliance (“GPSIA”), pursuant to the Public Notice (“Notice”) issued in the above-captioned proceeding (DA 18-131), hereby submits these comments on the Sensible Medical Innovations (“SMI”) Request for Waiver (“Request”) filed with the Commission on January 16, 2018. SMI requests waivers of several rules in Part 15 to enable it to market an ultra-wideband (“UWB”) medical monitoring device described as the ReDS system.¹

GPSIA strongly supports advances in medical technology and innovation and appreciates the potential future public benefits derived from the development of non-invasive monitoring applications. However, those benefits must be balanced against the concerns that the Commission recognized when it established rules governing protection of Global Positioning System (“GPS”) Radio Navigation Satellite Service (“RNSS”) signals from UWB devices. Accordingly, GPSIA suggests additional areas where the Commission should seek information from SMI before it proceeds.

¹ *Sensible Medical Innovations Request for Waiver*, ET Docket No. 18-39 (filed Jan. 16, 2018) (“Request”); see Public Notice, *Office of Engineering and Technology Seeks Comment on Sensible Medical Innovations Ltd.’s Request for Waiver of Part 15 Ultra-Wideband Rules for a Medical Imaging System*, DA 18-131 (rel. Feb. 9, 2018).

I. INTRODUCTION

The GPSIA was formed in February 2013 to protect, promote, and enhance the use of GPS and Global Navigation Satellite System (“GNSS”) technologies. GPS and GNSS systems, as well as augmentations to GNSS system, operate in frequency bands allocated to the RNSS. Members and affiliates of the GPSIA are drawn from a wide variety of fields and businesses reliant on GPS, including manufacturing, aviation, agriculture, construction, transportation, first responders, surveying, and mapping. The GPSIA also includes organizations representing consumers who depend on GPS for boating and other outdoor activities and in their automobiles, smart phones, and tablets.

The FCC initiated a proceeding in 2000 to permit the unlicensed operation of certain products incorporating UWB technology.² Recognizing that the wide bandwidth intrinsic to the operation of UWB devices could result in transmission of the intentional emissions into restricted frequency bands used for safety of life purposes, such as the GPS bands, the FCC requested comment on the impact of UWB devices on GPS.³ In response, GPS interests explained that any inclusion of additional transmissions in the GPS bands would increase the noise floor and decrease the value and reliability of existing services.⁴ The GPS interests therefore urged the FCC to, among other things, establish meaningful emission limits and associated measurement procedures to provide full protection to GPS and other safety-related

² See *Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems*, Notice of Proposed Rulemaking, 65 Fed. Reg. 37332 (2000) (“*UWB NPRM*”); see also *Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems*, Notice of Inquiry, 63 Fed. Reg. 50184 (1998).

³ See *UWB NPRM* ¶ 29.

⁴ See Comments of the U.S. GPS Industry Council, ET Docket No. 98-153, at 3 (filed Sept. 12, 2000).

services.⁵ Several parties also performed various analyses and tests to determine the interference potential from wideband sources and to determine the UWB emission levels necessary to prevent interference to GPS operation.⁶

In 2002, the FCC amended Part 15 of its rules to permit UWB technology.⁷ In response to the concerns raised regarding interference, the FCC adopted various operational restrictions on UWB devices, including unwanted emission limits to protect radio services such as GPS.⁸ The FCC further amended Part 15 of its rules in 2004 to provide greater flexibility to UWB technologies, but it left intact the protections for GPS.⁹ Because SMI's Request raises concerns about the compatibility of its UWB devices with GPS, the GPSIA is pleased to have the opportunity to submit the following comments.

II. SMI HAS NOT PRESENTED SUFFICIENT TECHNICAL INFORMATION TO JUSTIFY THE GRANT OF A WAIVER

The Commission may waive any provision of its rules if the petitioner demonstrates good cause for such action.¹⁰ Pursuant to Rule 1.925, a waiver may be granted if the petitioner establishes that: (1) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and the grant of the waiver would be in the public interest; or (2) in light of unique or unusual factual circumstances, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable

⁵ See *id.* at 41-47.

⁶ See *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, First Report and Order, 17 FCC Rcd. 7435, 7461 ¶ 71 (2002) (“2002 UWB Decision”).

⁷ See *id.*, 17 FCC Rcd. at 7444-45 ¶ 21.

⁸ See *id.*, 17 FCC Rcd. at 7437-38 ¶ 5.

⁹ See *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, First Report and Order, 19 FCC Rcd. 24558 (2004).

¹⁰ 47 C.F.R. § 1.3.

alternative.¹¹ “To make this public interest determination, the waiver cannot undermine the purpose of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.”¹²

The Commission takes a conservative approach applying these waiver standards to petitioners seeking to operate equipment co-channel with incumbent operations, placing a heavy burden on the petitioner to demonstrate how it will provide adequate protection from interference.¹³ When the petitioner does not adequately demonstrate how it will avoid creating interference, the Commission has not acted favorably on the waiver request.¹⁴ As demonstrated below, SMI has not yet provided sufficient information to support favorable Commission action at this time. Accordingly, GPSIA suggests that the Commission seek additional information from SMI in the following areas before it proceeds.

SMI’s Request discusses in some detail the claimed public interest benefits of its requested waiver. It describes the ReDS system as a bedside monitor that measures a patient’s lung fluid content, to manage patients suffering from congestive heart failure.¹⁵ The Request cites two studies published in medical journals that conclude the system can improve the care of these patients and reduce hospital readmission rates.¹⁶ GPSIA does not dispute that these would be substantial public interest benefits. Regrettably, however, the Request does not provide a similar level of detail about the technical operations of the device, making it impossible for the Commission and

¹¹ 47 C.F.R. § 1.925.

¹² *Kyma Medical Technologies Ltd. Request for Waiver of Part 15 of the Commission’s Rules Applicable to Ultra-Wideband Devices*, Order, 31 FCC Rcd. 9705, 9707 ¶ 5 (OET 2016) (“*Kyma Waiver Order*”).

¹³ *See, e.g., Request by Itron, Inc. for Waivers of the Commission’s Rules*, Opinion, 30 FCC Rcd. 137 (Jan. 13, 2015) (“*Itron Denial*”).

¹⁴ *Id.*

¹⁵ Request at 2-4.

¹⁶ *Id.* at 3.

other stakeholders to determine on the current record whether the waiver would “undermine the purpose of the rule,” or whether the claimed public interest benefits would be “stronger” than the benefits of applying the rule.

Of particular concern, SMI states that the ReDs System’s EN signal sweeps through 16 frequencies¹⁷ but SMI fails to fully identify those frequencies. SMI states that one of the frequencies it plans to use for its stepped-frequency modulation system is 1164.0625 MHz, which it admits is within the radionavigation-satellite service (“RNSS”) band.¹⁸ SMI does not acknowledge that 1164.0625 MHz, the RNSS L5 band, is designated for safety-of-life uses.¹⁹ It claims that this should be of little concern because the next frequency step is 1243.0625 MHz,²⁰ but it does not identify any of the *other* frequencies to be used. 1243.0625 MHz, of course, is also within an RNSS band, so it is unclear why SMI suggests that this next step would be of little concern. In any event, without a complete list of the proposed frequencies, neither the Commission nor GPSIA is able to determine whether the operation of this device would cause significant interference to GPS users in the vicinity of a ReDS device.

SMI acknowledges that while the ReDS System peak power is within peak limits, “average power will exceed the required level limits by about 17 dB (the most stringent requirement is the frequency band below 1610 MHz in which the limit is 29.9). Therefore, a power reduction of nearly 20 dB would be required to meet the one millisecond average power limits, and this

¹⁷ *Id.* at 10.

¹⁸ *Id.* at 6.

¹⁹ “The L5 radionavigation signal was designed to support safety-of-life transportation and other high-performance applications.” https://www.ntia.doc.gov/files/ntia/publications/compendium/1164.00-1215.00_01MAR14.pdf; *see also* RNSS and the ITU Radio Regulations Y. Henri and A. Matas, Inside GNSS, at 32-33 (January 2018) <http://www.insidegnss.com/auto/janfeb18-LAW.pdf> (RNSS uses include safety-of-life, critical navigation on land, at seas, and in the air.) (“RNSS Uses”).

²⁰ Request at 6-7.

would reduce SNR well below the levels needed for reasonable estimation accuracy.”²¹ Although SMI seeks a waiver of the Part 15 UWB power limits, it provides *no* testing or other emission data justifying its assertion that “there is very little risk of harmful interference to other services.”²²

The Request generally discusses the proposed system’s power levels, attenuation, and other signal characteristics,²³ which seems to imply that emissions tests have been performed. Unfortunately, the Report supplies no technical data beyond a few selected results. SMI’s meager technical showing is deficient.²⁴ SMI should be required to clarify what, if any, emissions testing it has performed, and should submit into the public record the detailed results of any such tests for the review of the Commission and other stakeholders.

The burden of justifying a waiver is on the petitioner.²⁵ SMI has not met its burden of demonstrating that its claimed public interest benefits outweigh the benefits of applying the rules that are designed to protect important navigation services against interference. Although the medical benefits of the proposed ReDS device may be substantial, GPS and other radio services that may be affected by UWB interference also serve important public safety and health purposes.

²¹ *Id.* at 10-11.

²² *Id.* at 11.

²³ *Id.*

²⁴ GPSIA notes that in the Kyma Waiver Request, petitioner there submitted Radiated Emission Test Results demonstrating that Kyma’s product operates within Commission emission limits at frequencies 1555 MHz, 1580 MHz, and 1605 MHz. See Kyma Medical Technologies Ltd. Waiver of Part 15 of the Commission’s Rules Applicable to Ultra-Wideband Devices, Request for Waiver, filed May 14, 2015, at Exhibit A, Section 5 (test report for Radiated Emissions Above 960 MHz describing test procedures and radiated emission test results for stepped frequencies 980-2105 MHz.)

²⁵ *Kyma Medical Technologies Ltd. Waiver of Part 15 of the Commission’s Rules Applicable to Ultra-Wideband Devices*, Order, 31 FCC Rcd. 9705, 9707 ¶ 5 (“*Kyma Waiver Order*”).

es.²⁶ On the current record, the Commission cannot find that the claimed benefits of ReDS outweigh the benefits of applying the rules, or that the proposed waiver will not undermine the purpose of the rules.

III. THE COMMISSION’S GRANT OF OTHER UWB RULE WAIVERS DOES NOT ABSOLVE SMI FROM PROVIDING SUFFICIENT TECHNICAL DATA TO JUSTIFY ITS WAIVER REQUEST

SMI argues that the “risk of interference due to operation of a ReDS System is no greater than other UWB medical imaging devices,”²⁷ According to SMI, its device is “functionally equivalent (or nearly equivalent) to” the device granted a waiver in the *Kyma Waiver Order*, and can be approved subject to similar operational conditions.²⁸ As noted in the *Kyma Waiver Order*, however, waivers of the UWB rules have been “based on the specific characteristics and intended use of each device.”²⁹ The Commission should continue that approach and, rather than simply grant a “me-too” waiver based on the *Kyma* conditions without a complete record justifying such a waiver, it should require SMI to provide a full technical description of its product, including specific frequency steps, and the procedures and results of appropriate emissions testing. Only then will the Commission – and interested stakeholders -- be able to assess the impact of proposed operations on GPS and other potentially affected services. Such information will be essen-

²⁶ GPS navigation is deeply embedded in many consumer, commercial, industry, and government functions and is an essential component to many applications bearing on health and safety of life. Examples are too numerous to recount but include applications in key public and government transportation systems, including aviation, railway, automobile, trucking, maritime, as well as use by first responders in public safety applications, industrial use in construction, forestry, etc. See RNSS Uses <http://www.insidegnss.com/auto/janfeb18-LAW.pdf> (describing RNSS safety-of-life applications).

²⁷ Request at 6.

²⁸ *Id.* at 6, 8.

²⁹ *Kyma Waiver Order*, 31 FCC Rcd. at 9708 ¶ 9.

tial even if the Commission decides to grant a limited waiver to ensure that any waiver granted is narrow and based on appropriate conditions.

IV. CONCLUSION

The GPSIA appreciates and supports advances in medical technologies and the promise that SMI's ReDS device might bring to treat congestive heart failure. The record currently before the Commission, however, fails to address questions, including how ReDS operations will impact critical GPS services. Those questions should be answered before SMI is allowed to proceed. The GPSIA therefore respectfully requests that the Commission defer any action on the requested Waiver until SMI provides complete technical and operational information regarding its product, including the information discussed herein, and it otherwise ensures that GPS operations are adequately protected.

Respectfully submitted,

/electronically signed/

Mark N. Lewellen

GPS INNOVATION ALLIANCE

Dated: March 12, 2018