

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

In the Matter of)	
)	
Amendment of Parts 2 and 95 of the Commission's Rules to Provide Additional Spectrum for the Medical Device Radiocommunication Service in the 413-457 MHz Band)	ET Docket No. 09-36

To: The Commission

Ex Parte Statement of the Society of Broadcast Engineers, Incorporated

The Society of Broadcast Engineers, Incorporated (SBE), the national association of broadcast engineers and technical communications professionals, hereby respectfully submits the following *Ex Parte* comments in the above-captioned proceeding. SBE has previously submitted comments in response to the *Notice of Proposed Rule Making*, FCC 09-36, 74 Fed. Reg. 22491, released March 12, 2009 (the Notice),¹ in which the Commission considered the feasibility of making available up to 24 megahertz of spectrum in the 413-457 MHz band to be used *on a secondary basis* in the Medical Device Radiocommunication Service (MedRadio Service) in Part 95 of the Commission's Rules. The Notice proposes to permit these and other devices, referred to collectively as wideband medical micropower networks (MMN) such as the neural stimulators to permit patient mobility following injury or damage to a patient's neuromuscular and other systems. SBE has further and continued concerns about this proceeding as the result of two recently-filed *Ex Parte* notices and exhibits submitted by the Alfred Mann Foundation (AMF) on April 8, 2011 and May 3, 2011, which made reference to tests of the susceptibility of the MMN devices to interference. SBE's

¹ The Notice was issued in response to the September 5, 2007 Petition for Rule Making filed by the Alfred Mann Foundation (AMF) which manufactures and wishes to market wide bandwidth, implantable neuromuscular microstimulation devices using wireless technologies.

principal concern about these studies conducted on behalf of AMF and submitted recently is that the tests involved only government land mobile and fixed transmitters. That testing is *not relevant* to a determination of interference susceptibility of MMNs from broadcast RPU facilities, and yet AMF claimed that “the findings and conclusions [of those studies] can be extrapolated to establish the EMC of MMN and incumbent non-government systems in the band.” This is absolutely wrong, and any such extrapolation is dangerous to the health and safety of patients. SBE states for the record as follows:

1. SBE’s comments in this proceeding, filed in August of 2009, noted that its interest in this proceeding is principally with respect to the interference *susceptibility* of devices which might be utilized in the MedRadio Service pursuant to rules which may be promulgated pursuant to the Notice. SBE expressed its concern that the Notice in this proceeding included no rules which would govern such interference susceptibility, and AMF itself offered no technical information that would allow an independent evaluation of such interference susceptibility.

2. The Notice in this proceeding refers to use of the bands 413-419 MHz, 426-432 MHz, 438-444 MHz and 451-457 MHz. The last of these includes spectrum utilized by Part 74, Subpart D, Remote Pickup (RPU) stations. RPU stations operate in, among other bands, 450-451 and 455-456 MHz. While some RPU operations are land mobile-like in their operations, being used for electronic news gathering by radio stations to report breaking news events ubiquitously, others, including IFB transmissions of audio in support of television production and RPU remote broadcasts, are substantially different. RPU and IFB operation typically have very long transmit duty cycles and effective radiated powers in the 40-100 watt range. RPU operation would be co-channel to MMNs in the proposed fourth MMN channel at 451-457 MHz. SBE argued in its comments in 2009 that it would be inappropriate and inconsistent with the Commission’s obligation to create an allocation that involves a predictable interference potential. Here, that is precisely what

is proposed: a secondary allocation for medical applications involving implanted muscle stimulator devices in a band where interference could potentially cause medical harm.² More broadly stated, it is poor spectrum policy to create a secondary allocation for an interference-susceptible medical device.

3. Earlier in this proceeding, the National Telecommunications and Information Administration (NTIA) stated that:

“Measurements are necessary to verify that the interference mitigation techniques will actually protect the MMN Service systems and the individuals that rely on them. To accomplish this, coordinated measurement efforts *with the incumbent spectrum users* are necessary. The MMN Service devices should be thoroughly evaluated prior to initiating a measurement program with the incumbent spectrum users. The authorization of the MMN Service will be subject to the successful completion of measurements that verify the interference mitigation techniques employed protect MMN Service devices from incumbent systems.”

SBE is unaware of any testing of MMNs that has involved RPU broadcast systems. Nor, from recent *ex parte* submissions by AMF in this proceeding, does it appear that any such compatibility analyses were conducted relative to broadcast RPU systems.

4. AMF claims it has done some EMC testing through ITT Corporation, using Comsearch as a subcontractor. The EMC analysis conducted by ITT was reported to the Joint Spectrum Center (JSC). The Mann Foundation draws a number of broad conclusions regarding the interference susceptibility of its MMN devices from this study. The Mann Foundation claims in its April 8, 2011 *ex parte* filing that a study was done of EMC between MMNs and incumbent government systems. These tests included “the EMC of MMN receivers – both master control unit (MCU) and implanted microstimulator receivers – in the presence of RF emissions from incumbent government systems.”

² The Notice in this proceeding, at paragraph 17, asks about the suitability of this band “for use by medical micro-power networks or other similar bandwidth intensive medical implant networks *that require a high degree of operational reliability*.” AMF itself has stated that the bands between 450 and 470 MHz are unsuitable due to the fact that the band is “congested and populated with commercial, high-power transmitters that could preclude reliable operation of lower-power, wireless medical implant devices.”

With respect to these tests specifically, AMF alleges that the study found that MMN “interference mitigation techniques of notching and dynamic channel switching...’*may effectively eliminate* the potential for [harmful interference] and allow the MMN to simultaneously operate with [incumbent government] systems at distances less than the calculated RSD.”(emphasis in original). AMF alleges that the ITT study also concluded that MMNs can operate without interference *from government fixed radiolocation transmitters* (sic) at distances less than the predicted RSDs “due to the low probability that the interfering and desired signals are received simultaneously, forward error correction techniques and the frequency agility of the MMN that is designed to dynamically switch channels when harmful interference is detected.”

5. At page 4 of the AMF April 8, 2011 *ex parte* filing, AMF states that:

Although the JSC Report did not specifically examine incumbent non-government systems in the 450-460 MHz frequency band, its findings and conclusions can be extrapolated to establish the EMC of MMN and incumbent non-government systems in the band. Non-government fixed and land mobile radio systems in the 450-460 MHz frequency band operate under comparable technical parameters as government fixed and land mobile radio systems in the 420-450 MHz frequency band. In fact, most of these non-government systems are virtually identical to their government counterparts and are supplied from the same manufacturers. Thus, in view of these technical similarities, the JSC Report’s EMC findings and conclusions are equally applicable to incumbent non-government fixed and land mobile radio systems in the 450-460 MHz frequency band.

Essentially, none of these statements is accurate with respect to broadcast RPU systems.

6. SBE has three concerns about the studies conducted and submitted by AMF in this proceeding, and the conclusions drawn by AMF about them. First of all, the testing that was done by ITT did not involve any broadcast RPU systems, and it was not done with any broadcast industry representatives involved. Second, the test conclusions are tentative on their face. The interference mitigation designs (AMF claims) “may” eliminate interference at certain distances. That determination of interference susceptibility is insufficient to permit the adoption of rules that will effectively protect patients against failures of the MMNs due to interference from licensed

incumbent radio services, even assuming that the extrapolation³ that AMF claims can be made is reasonable. Third, and most importantly, the testing that was performed, limited as it was to certain government systems, is not at all relevant to a determination of interference susceptibility of MMNs from broadcast RPU facilities.

6. Broadcast RPU facilities are substantially dissimilar to government fixed radar facilities and to government land mobile facilities. AMF's extrapolation argument, quoted above, assumes incorrectly that government land mobile equipment is identical, and operates on identical or similar parameters as non-government land mobile communications in the 450-460 MHz band. As SBE has previously explained in this proceeding, RPU operation is unique, and the testing of government land mobile and fixed radiolocation facilities reveals little or nothing about the EMC susceptibility of MMNs from RPUs. RPU operation is mobile and the locations unpredictable. While land mobile operations have intermittent duty cycles, RPU transmitters can and regularly do transmit continuously for several hours when a remote broadcast is in progress. MMN operation is not proposed to be restricted to medical care facilities. Even if it was, a remote broadcast at a local hospital (a frequent event in news gathering operations daily) would place the RPU transmitter in close geographic proximity to MMN patients. Such operation could generate a strong co-channel interfering signal that could be present for hours. Typical RPU base stations may have 46 to 50 dBm ERP. RPU systems generally use antennas close to ground levels and in the horizontal plane of the wearer of an MMN system. Power levels of RPU transmitters are typically 40 to 100 watts output power. RPUs have variable bandwidths. A 25 kHz emission at 100 watts would result in a power density of 4 mW/Hz. The same power using a 12.5 kHz bandwidth would yield a density of

³ AMF asserts without any technical support whatsoever that the EMC test results of MMN device susceptibility to interference from government land mobile systems can be extrapolated to apply as well to other incumbent systems, such as broadcast RPU operation.

80 mW/Hz. These levels are far higher than those that would be encountered by MMNs in close proximity to a government land mobile transceiver.

17. Ultimately, the conclusion to be drawn from the AMF submission is that the interference susceptibility of MMN devices from broadcast RPU systems and other Broadcast auxiliary uses is not known. It would be irresponsible and unwise to create a secondary allocation for MMNs anywhere in the 413-457 MHz band, and especially in the 451-457 MHz band at this time. The Broadcast Auxiliary Service has a practical inability to protect patients wearing RF-susceptible MMNs from interference from ongoing ubiquitous, mobile RPU operations in the 450-455 MHz band. There has been inadequate testing of these devices to date relative to interference susceptibility. The research cited by AMF in its *ex parte* filings recently is factually incorrect and infers an incorrect and dangerous extrapolation of data. The research does not reflect all uses in the identified bands, in particular the use by broadcasters of the Part 74 Broadcast Auxiliary bands. As such, SBE reiterates its opposition to MMN operation cannot be allowed at all in the broadcast auxiliary portion of the 451-457 MHz band. The use of these frequencies on a shared basis by medical equipment manufacturers is ill-conceived and unwise.

Respectfully submitted,

**SOCIETY OF BROADCAST ENGINEERS,
INCORPORATED**

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June 17, 2011