

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)
)
Office of Engineering and Technology)
Declares Multispectral Solutions Inc.) ET Docket No. 06-103
Request for a Waiver of Part 15 to Be)
a "Permit-but-Disclose" Proceeding)
for Ex Parte Purposes)

**COMMENTS OF THE
FIXED WIRELESS COMMUNICATIONS COALITION**

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The Fixed Wireless Communications Coalition (FWCC) files these comments in the above-captioned proceeding.¹

Multispectral Solutions Inc. (MSSI) requests a waiver to increase the peak power allowed under Section 15.250 from 0 dBm/50 MHz to 12.75 0 dBm/50 MHz.²

The rule provision in question, Section 15.250, allows ultra-wideband-like operation over 5925-7250 MHz. This range includes the "Lower 6 GHz" Fixed Service band at 5925-6425 MHz, the "Upper 6 GHz" band at 6525-6875 MHz, and Part 74 Broadcast Auxiliary Service

¹ *Office of Engineering and Technology Declares Multispectral Solutions Inc. Request for a Waiver of Part 15 to Be a "Permit-but-Disclose" Proceeding for Ex Parte Purposes*, ET Docket No. 06-103, Public Notice, DA 06-1025 (released May 12, 2006). The FWCC is a coalition of companies, associations, and individuals interested in the Fixed Service -- *i.e.*, in terrestrial fixed microwave communications. Our membership includes manufacturers of microwave equipment, licensees of terrestrial fixed microwave systems and their associations, and communications service providers and their associations. The membership also includes railroads, public utilities, petroleum and pipeline entities, public safety agencies, cable TV providers, backhaul providers, and/or their respective associations, common carrier and private communications carriers, and telecommunications attorneys and engineers. Our members build, install, and use both licensed and unlicensed point-to-point, point-to-multipoint, and other fixed wireless systems, in frequency bands from 900 MHz to 95 GHz. For more information, see www.fwcc.us.

² Letter from Robert J. Fontana, President, MSSI, to Julius Knapp, Acting Chief, OET (dated April 12, 2006; date-stamped May 10, 2006).

bands at 6425-6525 MHz and 6875-7125 MHz. The latter is also a Cable Television Relay Service (CARS) band.

A. Fixed Service Bands Affected by Waiver

The 6 GHz Fixed Service bands are heavily used to carry critical services such as public safety communications (including police and fire vehicle dispatch), coordinating the movement of railroad trains, controlling natural gas and oil pipelines, regulating the electric grid, and backhauling wireless telephone traffic. Many of these applications routinely require 99.999% or 99.9999% availability.

As of April 1, 2006, the Lower and Upper 6 GHz bands in the United States supported 40,514 and 30,835 transmitters, respectively. Growth rate in these bands over the past two years has been 1 percent and 3 percent, respectively, amounting to more than 1300 new transmitters per year. Growth is likely to increase during the next few years as Fixed Service licensees are displaced and relocated from 2 GHz spectrum being taken over by other services. Few, if any, of these users can move to the 4 GHz band, where the large number of C-band receive earth stations has made coordinating new Fixed Service links all but impossible. The next bands up, the Upper and Lower 6 GHz, are the most attractive option -- sometimes the only option -- for links of significant length.

B. Effect of Waiver on Fixed Service Noise Floor

The FWCC did not oppose either the initial ultra-wideband rules in 2002 or the establishment of Section 15.250 in 2004, even though each permitted new operations on some of our most heavily-used frequencies. The maximum peak emissions from ultra-wideband and

Section 15.250 devices are lower than the out-of-band limits for Part 101 transmitters,³ so we reasoned they should present less of an interference threat than our own equipment does. And we estimated the likelihood of having many such devices operating simultaneously in our receiver boresights to be low.

The MSSSI request re-opens both of these issues.

Operation under the MSSSI waiver could raise the noise floor in the 6 GHz Fixed Service bands by 9 dB, and consequently reduce a system's fade margin by the same amount.⁴ Many Fixed Service systems cannot tolerate a 9 dB loss in fade margin without severe consequences.

A 9 dB increase in the noise floor would also nullify much of the interference protection and spectral compatibility provided by Fixed Service transmitters using automatic transmitter power control (ATPC).⁵ Ordinarily ATPC keeps the transmit power well below the permitted maximum. But raising the noise floor will result in the ATPC circuitry raising the transmit power by a like amount, thus compromising the advantages of ATPC and lower transmit power.

³ Fixed Service transmitters are subject to a minimum out-of-band emissions limit (at frequencies more than 50% of the authorized bandwidth away from the assigned frequency) of -13 dBm/MHz. 47 C.F.R. Sec. 101.111(a)(2)(i), (iii). This is equivalent to +4 dBm/50 MHz. The current peak power emission limit in Section 15.250 (which MSSSI seeks to have waived) is 4 dB lower, at 0 dBm/50 MHz. 47 C.F.R. Sec. 15.250(d)(3).

⁴ MSSSI's requested increase of 12.75 dB in peak power would raise that limit to 12.75 dB/50 MHz. This is 9 dB higher than the Part 101 out-of-band limit of +4 dBm/50 MHz (preceding footnote).

⁵ The Commission defines ATPC as follows: "ATPC is a feature of a digital microwave radio system that adjusts the transmitter output power. ATPC allows the transmitter to operate at less than maximum power for most of the time. In a radio employing ATPC, the transmit power is reduced during normal operation conditions. When the receiver detects a reduction in signal level, a control signal is sent to the far end transmitter, instructing it to increase the power output to compensate for the signal reduction. . . ." 47 C.F.R. Sec. 101.3.

Moreover, deploying over-powered Section 15.250 devices as active RFID tags, as MSSSI proposes, could result in far more devices per unit area than in conventional ultra-wideband applications, such as communications and radar. We are especially concerned about the concentration of MSSSI-equipped cattle in feedlots and similar facilities that crowd thousands of animals in a small space, where the signals could add up to harmful levels. The aggregated signals, and hence the interference threat, would be exacerbated by high duty cycles and/or by any synchronization among the devices that could cause many to emit simultaneously.

We note also that MSSSI's request does not expressly limit waived devices to the two applications mentioned. This leaves open the possibility that other applications could similarly result in high device concentrations.

C. Proposed Limitations on Waivered Units

With the foregoing considerations in mind, the FWCC asks the Commission to impose the following conditions on any grant of MSSSI's request:

- The Commission should limit the waiver to the two applications cited by MSSSI: tracking of cattle and tracking of personnel and assets at petrochemical facilities.
- The Commission should require MSSSI to advise its petrochemical customers that the waived MSSSI devices use the same frequencies as 6 GHz Fixed Service communications, so as to assist those customers in identifying and correcting any interference, should it occur.
- The Commission should limit the duty cycle of each waived device to no more than one part in 1,000,000.
- The Commission should prohibit the synchronization of waived devices. If devices are programmed to operate at fixed intervals, the Commission should require enough variation in their timing that the emissions from a population of devices do not accumulate in particular time slots.

CONCLUSION

The Commission can minimize the likelihood of interference from waived MSSI devices into 6 GHz Fixed Service receivers by adopting the waiver conditions proposed above.

Respectfully submitted,

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