National Public Safety Telecommunications Council

68 Inverness Lane East
Englewood, CO 80112
Fax 303-649-1844
866-807-4755 ● 303-649-1843
Website: www.npstc.org

FILED ELECTRONICALLY

September 10, 2004

Mr. John Muleta
Chief – Wireless Telecommunications Bureau
Federal Communications Commission
445 12th St. SW
Washington DC 20554

RE: WT Docket 00-32

Dear Chief Muleta:

After review of Motorola's Ex Parte filing of August 30, 2004, NPSTC now believes that NPSTC and Motorola appear to be in near-agreement on the 4.9 GHz Mask and Power Limit issues. We have had significant discussion with representatives of Motorola to address our concerns with the 08/30/04 Motorola proposed Part 90 Rules. Although there is still disagreement regarding the power levels at which equipment must transition to a tighter mask (Motorola still maintains that an 8 dBm transition to the tighter Mask is the best for Public Safety, while NPSTC very strongly believes that this transition should be at 20 dBm for a 20-MHz channel bandwidth), these discussions have otherwise been very successful. From these discussions we have reached agreement on our recommendations for the proposed Rules language for the Emission Mask and Power limits - for the case where there is a 20 dBm (at 20-MHz bandwidth) transition to the tighter mask. The suggested changes that we have agreed upon are attached hereto. The main non-editorial changes to Motorola's August 30 filing can be summarized as follows:

- **§ 90.210** (l & m): change "*any emission must be attenuated below the output power of the transmitter as follows:*" to "*the power spectral density of the emissions must be reduced as follows:*"

- **§ 90.210** (l & m) (1-4): change "*authorized bandwidth*" to "*channel bandwidth*".
- **§ 90.210** (l & m) (5): change "*-53 dBm/MHz*" to "*-50 dBm/MHz*".
- **§ 90.210** (l & m) (6): change "*Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.*" to "*The power spectral density, P(f)/∆f will be the power (P) measured within the resolution bandwidth of the measurement device (∆f) divided by the resolution bandwidth of the measurement device (∆f). Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth (∆f) of at least one percent of the occupied bandwidth.*"
- **§ 90.1215** (a): change "*20 dBm per 1 MHz*" to "*21 dBm per 1 MHz*", and "*20 dBm/MHz*", to "*21 dBm/MHz*". This allows technologies with signal bandwidths greater than or equal to about 80% of the channel bandwidth to be utilized without power penalty.
- **§ 90.1215** (a): change "*7 dBm per 1 MHz*" to "*8 dBm per 1 MHz*", and "*7 dBm/MHz*", to "8 *dBm/MHz*". This allows technologies with signal bandwidths greater than or equal to about 80% of the channel bandwidth to be utilized without power penalty. It also imposes power restrictions upon spectrally inefficient technologies that occupy less than 80% of the channel bandwidth.
- **§ 90.1215** (a): all occurrences of "*6 dBi*" to "*9 dBi*".
- **§ 90.1215** (d): delete entire section.

We continue to stress NPSTC's position that the proper transition point to the stricter mask should be at 20 dBm for a 20-MHz technology, and at 17 dBm for a 10-MHz technology. We feel that we have clearly supported this position in the record, especially in our August 19, 2004 filing. From these showings in particular, it is clear that widely deployed standard technologies (with their emmisions characteristics) can be used to support first responder operations, even extremely complex and stressing incidents, without any noticeable degradation in Quality of Service (QoS) to the end users at the scene, and with little, if any, incident spectrum management required. Furthermore, it was made clear that the selection of a standard emission mask (i.e., DSRC Mask A or IEEE 802.11a/j) over a more stringent mask (i.e., DSRC Mask C) has little, if any, effect upon real life user operations at power levels up to 20 dBm - and potentially to much higher power levels, as demonstrated in NPSTC's August 19 filing.

Again, we clearly reiterate our continue assertion that the selection and mandate of an emissions mask stricter than that represented by standard IEEE 802.11 OFDM technologies will only serve to limit the gains that would otherwise be afforded by market driven forces. It will not provide any significant performance gains, and will in fact stifle the technological innovation and economic gains that

would be otherwise available by properly aligning public safety's requirements with technologies developed for larger markets with similar requirements. It would also work contrary to our efforts to work within standards development bodies such as IEEE 802.11 to stimulate the development of advanced technologies that can effectively serve the needs of public safety.

Sincerely,
Marilyn Ward, Chair
National Public Safety Telecommunications Council

CC: Chairman Michael K. Powell
Commissioner Kathleen Q. Abernathy
Commissioner Michael J. Copps
Commissioner Kevin J. Martin
Commissioner Jonathan S. Adelstein

NPSTC's Recommended Part 90 Rules Modifications Regarding Emissions Masks and Power Limits September 10, 2004

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§ 90.210 Emission masks.

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APPLICABLE EMISSION MASKS

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
* * * * *	* * * * *	* * * * *
4940-4990 MHz	L, M	L, M
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(l) **Emission Mask L**. For Class A transmitters operating in the 4940-4990 MHz frequency band, the power spectral density of the emissions must be reduced as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent but less than 55 percent of the channel bandwidth: At least 26 dB.

(2) On any frequency removed from the assigned frequency by more than 55 percent but less than 100 percent of the channel bandwidth: At least 32 dB.

(3) On any frequency removed from the assigned frequency by more than 100 percent but less than 150 percent of the channel bandwidth: At least 40 dB.

(4) On any frequency removed from the assigned frequency by more than 150 percent of the channel bandwidth: At least 50 dB.

(5) On any frequency outside the channel bandwidth, the power spectral density of the device must meet the attenuation in the mask above or -50 dBm/MHz, whichever is the lesser attenuation.

(6) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density, $P(f)/\Delta f$ will be the power (P) measured within the resolution bandwidth of the measurement device (Δf) divided by the resolution bandwidth of the measurement device (Δf). Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth (Δf) of at least one percent of the occupied bandwidth.

(m) **Emission Mask M**. For Class B transmitters operating in the 4940-4990 MHz frequency band, the power spectral density of the emissions must be reduced as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent but less than 55 percent of the channel bandwidth: At least 10 dB.

(2) On any frequency removed from the assigned frequency by more than 55 percent but less than 100 percent of the channel bandwidth: At least 20 dB.

(3) On any frequency removed from the assigned frequency by more than 100 percent but less than 150 percent of the channel bandwidth: At least 28 dB.

(4) On any frequency removed from the assigned frequency by more than 150 percent of the channel bandwidth: At least 40 dB.

(5) On any frequency outside the channel bandwidth, the power spectral density of the device must meet the attenuation in the mask above or -50 dBm/MHz, whichever is the lesser attenuation.

(6) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density, $P(f)/\Delta f$ will be the power (P) measured within the resolution bandwidth of the measurement device (Δf) divided by the resolution bandwidth of the measurement device (Δf). Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth (Δf) of at least one percent of the occupied bandwidth.

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§ 90.1215 Power limits.

The transmitting power of stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this section.

(a) The peak transmit power should not exceed:

Channel Bandwidth (MHz)	Class A Peak Transmitter Power (dBm)	Class B Peak Transmitter Power (dBm)
1	20	7
5	27	14
10	30	17
15	31.8	18.8
20	33	20

(i) Class A devices are limited to a peak power spectral density of 21 dBm per 1 MHz. Class A devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi.

(ii) Class A point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) devices may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.

(iii) Class B devices are limited to a peak power spectral density of 8 dBm per 1 MHz. Class B devices using channel bandwidths other than those listed above are permitted; however they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmitter power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi.

(b) The peak transmit power is measured as a conducted emission over any interval of continuous transmission calibrated in terms of an rms-equivalent voltage. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. The measurement results shall be properly adjusted for any instrument limitations, such as

detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement conforming to the definitions in this paragraph for the emission in question.

(c) The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.