

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC**

In the Matter of )  
 )  
Emission Mask Requirements for Digital ) PS Docket No. 13-209  
Technologies on 800 MHz NSPAC Channels; ) RM-11663  
Analog FM Capability on Mutual Aid and )  
Interoperability Channels )  
 )

**COMMENTS OF MOTOROLA SOLUTIONS, INC.**

Motorola Solutions, Inc. (“Motorola Solutions”) hereby submits these Comments in response to the Federal Communications Commission’s (“Commission”) Notice of Proposed Rulemaking that addresses the technical standards for operating on certain public safety channels available under Part 90 of the Commission’s Rules.<sup>1</sup>

**I. BACKGROUND AND SUMMARY.**

The issues in this proceeding arose largely out of the Commission’s proceeding addressing the use of Terrestrial Trunked Radio (“TETRA”) based radio equipment on Part 90 frequencies.<sup>2</sup> In that proceeding, there was discussion of the applicability of the out of band emissions limits specified in Section 90.210(b) (“Emissions Mask B”) when certifying digital technologies to operate in the 806-809/851-854 MHz band – the 800 MHz National Public Safety Planning Advisory Committee (“NPSPAC”) band.<sup>3</sup> Industry practice has been to apply

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<sup>1</sup> See Emission Mask Requirements for Digital Technologies on 800 MHz NSPAC Channels; Analog FM Capability on Mutual Aid and Interoperability Channels, PS Docket No. 13-209, RM-11663, *Notice of Proposed Rulemaking*, FCC 13-117 (rel. Aug. 27, 2013) (“Notice”).

<sup>2</sup> See Amendment of Part 90 of the Commission’s Rules to Permit Terrestrial Trunked Radio (TETRA) Technology, WT Docket No. 11-69, ET Docket No. 09-234, *Report and Order*, 27 FCC Rcd 11569 (2012) (“*TETRA Report and Order*”).

<sup>3</sup> See, e.g., Letter from Patrick Sullivan, Harris Corp. to Marlene H. Dortch, Secretary, FCC, WT Docket 11-69, ET Docket No. 09-234 (March 16, 2012); Letter from Jose Martin,

the out of band emission limits contained in Section 90.210(h) (“Emissions Mask H”) for certifying digital technologies on the NPSPAC channels.

In the instant Notice, the Commission proposes to clarify this issue by requiring all digital technologies operating in the NPSPAC channels to comply with Emissions Mask H as a condition of certification.<sup>4</sup> Further, the Commission proposes to reaffirm that a common modulation is required for operations in the 800 MHz mutual aid channels and the VHF and UHF public safety interoperability calling channels.

Motorola Solutions applauds the Commission for addressing these important matters in prompt fashion. As further discussed below, Motorola Solutions urges the Commission to apply Emission Mask H to all digital technologies operating in the NPSPAC band. Motorola Solutions also urges the Commission to make clear that equipment designed to operate on designated public safety mutual aid or interoperability channels in the 800 MHz, VHF and UHF bands must have analog FM capability for interoperability purposes. These actions will promote interoperability, efficiency, and interference-free operations in crucial, and heavily-used, public safety communications bands.

## **II. DIGITAL TECHNOLOGIES OPERATING IN THE 800 MHZ NPSPAC CHANNELS SHOULD COMPLY WITH EMISSION MASK H.**

The Commission should mandate digital technologies operating on the NPSPAC channels to comply with Emission Mask H. The rules governing interference protection and interoperability in the 800 MHz NPSPAC band should be applied in a technology neutral fashion. This ensures that system designers and Regional Planning Committees (“RPCs”) have a consistent understanding of the spectrum and interference environment, while also allowing the

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Executive Vice President, PowerTrunk, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket 11-69, ET Docket No. 09-234, (March 23, 2012).

<sup>4</sup> Notice, ¶ 10.

introduction of new technologies to the band in as efficient and interference-free a way as possible.

The needs for certainty and predictability are especially pressing in the challenging interference environment of the NPSPAC channels. As the Commission points out, the NPSPAC channels are 25 kilohertz bandwidth channels spaced 12.5 kilohertz apart, making them more susceptible to adjacent-channel interference than other 800 MHz channels.<sup>5</sup> The success of public safety communications in these channels is due in large part to the expert work of the RPCs, which take interference concerns into account when recommending frequencies for licensing in the band, and the more stringent technical standards applied to the band by the Commission. It is essential that the Commission protect incumbent public safety users in the NPSPAC channels, promote continued interoperability in this band, and support the RPCs in their coordination efforts.

Currently, the Commission's rules specify that devices operating on the NPSPAC channels without an audio low pass filter must conform to Emission Mask H.<sup>6</sup> Equipment incorporating an audio low pass filter is permitted to operate in the NPSPAC band in conformance with the less protective, Emission Mask B.<sup>7</sup> As the Commission correctly points out in the Notice, Emission Mask B comes from an earlier era and was based on assumptions regarding voice operations over analog FM transmitters.<sup>8</sup> Although not explicitly required by the Commission's rules, under Section 90.210, it became the standard practice that the B-Mask applied to analog voice devices and the more stringent Mask H applied to data devices that did

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<sup>5</sup> *Id.*, ¶ 13.

<sup>6</sup> 47 C.F.R. § 90.210.

<sup>7</sup> *Id.*

<sup>8</sup> Notice, ¶ 10.

not employ a low-pass filter. While some digital devices have been authorized for 800 MHz operations that comply with the less-stringent Mask B based on incorporation of an audio low-pass filter, nearly all digital technologies actually operating in the NPSPAC band comply with Mask H, making it the *de facto* standard for the band.

The Commission is correct in its view that introduction of digital technologies with significantly different interference characteristics into the NPSPAC channels “would impose an additional burden on RPCs and would necessarily restrict the ability of the RPCs to make efficient use of the NPSPAC spectrum.”<sup>9</sup> The RPCs are experienced in managing the sharing of the NPSPAC channels and other limited public safety spectrum resources, however the regional planning process takes into account the existing standards, including the use of Mask H.

Motorola Solutions has highlighted the potential coordination challenges on the record in this and other proceedings.<sup>10</sup> For example, as Motorola Solutions previously explained, “the introduction of non-similar communication technologies into the NPSPAC channels could greatly increase the required effort by the relevant regional planning committees to ensure that interference to users occupying adjacent NPSPAC channels in that region is avoided.”<sup>11</sup>

Motorola Solutions argued that such a scenario could create “at a minimum, the need for greater geographical spacing between adjacent channel users to avoid interference. In the worst case, it could require the complete revamping of a region’s radio communications plan.”<sup>12</sup>

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<sup>9</sup> *Id.*, ¶ 12.

<sup>10</sup> *See, e.g.*, Letter from Chuck Powers, Director, Engineering and Technology Policy, Motorola Solutions, Inc. to Marlene H. Dortch, Secretary, FCC at 2, WT Docket No. 11-69 (filed Mar. 30, 2012) (“Motorola Solutions March 30, 2012 Ex Parte”); Comments of Motorola Solutions, Inc. at 3, RM-11663 (filed July 2, 2012) (“Motorola Solutions Comments”).

<sup>11</sup> Motorola Solutions March 30, 2012 Ex Parte at 2.

<sup>12</sup> *Id.*

Because of the uniquely sensitive interference environment, the Commission should require that all digital equipment being deployed in the 800 MHz NPSPAC band going forward – including TETRA variants – conforms to Emissions Mask H. As the Commission points out in the Notice, it has previously adopted rule changes that render certified equipment no longer permissible in certain bands, as it did in the narrowbanding context.<sup>13</sup> Although not the typical course of action, the potential interference risk to public safety users in this band merits the Commission applying the new requirement to all equipment, even if it means that equipment authorized under Mask B must have its certification updated before future deployments can be conducted. All modified certifications and new certifications for digital equipment operating in the 800 MHz NPSPAC channels should be held to Mask H. Vendors should also be prohibited from marketing non-compliant equipment for use in the 800 MHz NPSPAC band under the previous authorization.

The Commission should not develop a new mask or adopt other new technical standards specifically to accommodate the introduction of non-similar digital technologies to the NPSPAC band as contemplated in the Notice.<sup>14</sup> Introduction of these technologies under different rules will pose the same problems as allowing them to be operated in the NPSPAC band under the less protective Emission Mask B. Regardless of whether the Commission crafts a special mask or set of rules for these technologies, they will still potentially interfere with incumbent services in the NPSPAC spectrum; they will still significantly complicate the job of the RPCs; and they will still disserve interoperability among public safety systems. The existing Emissions Mask H has proven sufficient to mitigate interference concerns while also allowing robust and efficient deployment of digital technologies in the NPSPAC band.

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<sup>13</sup> Notice, ¶ 13 (citing 47 C.F.R. § 90.209(b)).

<sup>14</sup> *Id.*, ¶ 14.

### **III. THE COMMISSION SHOULD CLARIFY ITS REQUIREMENTS FOR USING ANALOG FM AS THE COMMON MODULATION FOR OPERATION ON THE PUBLIC SAFETY MUTUAL AID CHANNELS.**

To ensure interoperability, the Commission should specify a common modulation as a requirement for equipment authorization in the 800 MHz NPSPAC mutual aid channels and the VHF and UHF public safety interoperability channels. Seamless interoperability is essential for the mutual aid channels and interoperability calling channels to fulfill their vital purpose in times of emergency. There is no room for the confusion or delay that could result should the Commission waver on this point.

Motorola Solutions firmly believes that the Commission's rules already require devices designed to operate on the NPSPAC channels to be capable of operating in analog FM mode when transmitting on the mutual aid channels.<sup>15</sup> Section 90.203(i) requires equipment certificated for the NPSPAC channels be capable of being programmed for operation on the mutual aid channels as designated in Section 90.617(a)(1) of the rules.<sup>16</sup> Section 90.617 specifies that assignment of the NPSPAC channels be done in accordance with the policies defined in the *NPSPAC Report and Order*.<sup>17</sup> The *NPSPAC Report and Order* sets an analog FM mandate by requiring that the channels be operated in the conventional mode with tone coded squelch at a standard frequency of 156.7 Hz, a requirement that could not be met with digital emissions.<sup>18</sup> While these policies and rules have been in place for more than two decades and are well understood by the users and most of the industry, additional clarity in the rules would be

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<sup>15</sup> Motorola Solutions Comments at 5.

<sup>16</sup> 47 C.F.R. § 90.203(i).

<sup>17</sup> 47 C.F.R. § 90.617(a)(1) (citing Development and Implementation of a Public Safety National Plan and Amendment of Part 90 to Establish Service Rules and Technical Standards for Use of the 821–824/866–869 MHz Bands by the Public Safety Services, Gen. Docket 87-112, *Report and Order*, 3 FCC Rcd 905 (1987) (“*NPSPAC Report and Order*”).

<sup>18</sup> *NPSPAC Report and Order*, ¶ 28.

beneficial to ensure that all manufacturers fully comprehend the requirement. Motorola Solutions therefore recommends that the Commission modify its rules to make clear that devices certificated to operate on the NPSPAC channels must include an Analog FM mode to enable interoperable communications on the 800 MHz mutual aid channels and that Analog FM is required for operation on the VHF and UHF public safety interoperability calling channels.

#### **IV. CONCLUSION**

Motorola Solutions supports the Commission's proposals in the Notice, which will help prevent interference and promote interoperability among public safety communications systems. Specifically, the Commission should adopt a requirement that all devices using digital technologies to operate in the NPSPAC channels be certified as compliant with Emission Mask H. Additionally, the Commission should specify a common modulation as a requirement for equipment authorization in the 800 MHz NPSPAC mutual aid channels and the VHF and UHF public safety interoperability channels, while also considering a roadmap for the eventual transition to digital technologies in these channels.

Respectfully submitted,

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