

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

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

**COMMENTS OF APCO**

The Association of Public-Safety Communications Officials-International, Inc. (“APCO”) hereby submits the following comments in response to the Commission’s *Notice of Proposed Rulemaking*, FCC 13-117, released August 27, 2013 (“*NPRM*”), in the above-captioned proceeding.

Founded in 1935, APCO is the nation’s oldest and largest public safety communications organization. Most APCO members are state or local government employees who manage and operate communications systems for police, fire, emergency medical, forestry conservation, highway maintenance, disaster relief, and other public safety agencies. APCO is the largest FCC-certified frequency coordinator for Public Safety Pool frequencies and appears regularly before the Commission on a wide range of public safety communications issues.

*NPSPAC Emission Mask Issues*

The Commission proposes that it modify its rules to require digital technologies, including but not limited to Terrestrial Trunked Radio (TETRA) based technologies, to comply with Emission Mask H when operated in the 800 MHz National Public Safety Planning Advisory Committee (NPSPAC) band (806-809/851-854 MHz). The FCC also proposes to require equipment to have analog FM capability when operating on 800 MHz, VHF, and UHF public

safety mutual aid and interoperability channels. APCO supports the Commission's proposals, which will help prevent interference to critical public safety communications and promote interoperability among first responders in the field.

Requiring Mask H compliance in the 800 MHz NPSPAC band is necessary due to the unique 12.5 kHz channel spacing adopted for those frequencies. The NPSPAC band has been available to public safety users for more than two decades and has extensive incumbent use. This is especially the case in heavy populated, spectrum congested areas. The Regional Planning Committees (RPCs) in these highly dense areas have accrued nearly two dozen years of experience in effectively managing this spectrum to obtain the maximum reuse of the available spectrum using the existing emission masks (Mask B for analog systems and Mask H for digital systems).

APCO shares and supports the Commission's view that implementation of any digital system utilizing Mask B standards potentially jeopardizes incumbent co-channel and adjacent-channel public safety operations, and creates additional burdens on RPCs. Allowing new digital technologies not meeting the Mask H criteria to occupy the NPSPAC band would reduce existing levels of adjacent channel interference protection and could require significant revisions to regional plans and re-coordination of current incumbent operations. This would be extremely difficult, if not impossible, in densely packed urban areas. It could also impose substantial fiscal burdens on the operators of incumbent systems required to comply with revised coordination parameters, and potentially create a significant loss of flexibility in the spectrum management of the band.

The Commission seeks comment on a PowerTrunk's assertion that its so-called "low power TETRA" operations be permitted without Mask H compliance, based on PowerTrunk's

use of a “root raised cosine digital filter” in its equipment. APCO notes that, with 22 kHz wide modulation in the NPSPAC band, there is a large channel overlap that a lower power level does not restrict. While raised root cosine filtering may provide a rapid drop off of signal level in the adjacent channel, the wider modulation still overlaps the adjacent channel. APCO notes that analog FM receivers using Butterworth filtering will experience significantly higher levels of interference from the wider modulation. This is one of the reasons why NPSPAC narrowed emissions bandwidth by requiring the tighter Mask H for digital transmissions and the lower 4 kHz deviation for analog transmissions.

PowerTrunk also asserts that its equipment is more spectrum efficient, and that should overcome any loss in interference protection or interoperability. In fact, the proposed technology would lead to reductions, not improvements, in spectrum efficiency for public safety spectrum. Use of a Mask B-compliant digital signal would negate regionally coordinated reuse and band compaction efforts in spectrum-congested areas. Such equipment impacts both the co-channel and the two adjacent channel assignees. APCO is also unaware of any capability to simulcast TETRA signals. Any wide area TETRA system would need to be constructed in a cellular-like fashion, with an increased number of infrastructure transmitting sites, each requiring its own set of discrete channels. This is not an efficient use of the limited spectrum when working to cover large geographic operating areas in spectrally challenged regions of the country. Any perceived efficiency gains created by increased data rates would be likely negated by the increased requirement of spectrum to cover a wide area.

The Commission also asks whether it should consider adopting a new emissions mask to accommodate digital technologies. APCO notes that many other digital technologies certified to meet the existing Mask H have been introduced into the 800 MHz band over the past 20 years,

with minimal impact on incumbent adjacent channel licensees. In any event, any new mask or adjacent channel power table for digital technologies would need to provide the same level of protection as the current Mask H.

### *Analog FM Capability*

The Commission notes that its current rules do not expressly require use of a common modulation for interoperability and mutual aid frequencies,<sup>1</sup> and seeks comments on establishing analog FM as such a standard. APCO strongly supports establishing analog FM as the FCC-mandated common modulation for interoperability and mutual aid frequencies in the 150-174, 450-470, and 800 MHz bands, and recommends that all equipment certified for use by public safety entities in those bands be required to include analog FM emissions (11K0F3E or 16K0F3E, depending on band) capabilities.

Analog FM is already the *de facto* national interoperability standard in public safety bands with mixed analog and digital operations because of its widespread use and availability in both older and newer equipment from multiple vendors. Public safety users learned long ago that allowing mixed modes negates efforts to achieve interoperability. Indeed, other code and ANSI standards-setting organizations already require the use of analog FM modulation in certain public safety communications settings. Examples include the *APCO/NPSTC Standard Channel Nomenclature for the Public Safety Interoperability Channels*, APCO/NPSTC ANS 1.104.1-2010,<sup>2</sup> the U.S. Department of Homeland Security's National Interoperability Field Operations Guide, Version 1.4<sup>3</sup> and National Fire Protection Association standard 1221 (2013 Edition),

---

<sup>1</sup> The exception is the 700 MHz public safety band, where Project 25 is the required digital standard for narrowband interoperability channels and LTE is the broadband standard.

<sup>2</sup> [http://www.apco911.org/component/docman/doc\\_download/137-standard-channel-nomenclature-for-the-public-safety-interoperability-channels.html](http://www.apco911.org/component/docman/doc_download/137-standard-channel-nomenclature-for-the-public-safety-interoperability-channels.html) (accessed November 7, 2013).

<sup>3</sup> <https://www.dhs.gov/national-interoperability-field-operations-guide>, (accessed November 7, 2013).

sections 9.3.1.3, 9.3.1.4, and 9.3.1.5.<sup>4</sup> The Commission should add the weight of its rules to this important interoperability standard.

APCO notes that the Commission's proposed language in Appendix A of the *NPRM* for the FM modulation requirement in Section 90.203(i) states "(i) Equipment certificated after DATE and marketed for public safety operation in the 806–809/851–854 MHz bands must have the capability to be programmed for analog FM operation on the mutual aid channels as designated in §90.617(a)(1) of the rules." This would appear to apply to fixed, mobile and portable equipment on all five mutual aid channels. In contrast, the proposed language for §90.203(j)(1) only references “mobile and portable transmitters” and only applies to operations on nationwide interoperability *calling* channels.

Common analog FM emission requirements for only mobiles and portables, and limiting the requirements to the nationwide interoperability calling channels in the 150-174 MHz and 450-470 MHz bands, only partially resolves the issue of enhanced public safety interoperability. Therefore, APCO recommends that the language of proposed §90.203(j)(1) be changed to read as follows:

(1) Equipment certificated after DATE and marketed for public safety operation in the 150–174 MHz band will be granted only if the equipment is capable of operating in the analog FM mode on the nationwide public safety interoperability channels in the 150–174 MHz band. (See §90.20(c),(d) of this part.) Equipment certificated after DATE and marketed for public safety operation in the 450–470 MHz band will be granted only if the equipment is capable of operating in the analog FM mode on the nationwide public safety interoperability channels in the 450–470 MHz band. (See §90.20(c),(d) of this part.)

---

<sup>4</sup> National Fire Protection Association standard 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, 2013 Edition (<http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1221>, accessed November 7, 2013) :

9.3.1.3: *A communications radio channel, separate from the radio dispatch channel, shall be provided for on-scene tactical communications.*

9.3.1.4: *At a minimum, the tactical communications channel identified in 9.3.1.3 shall be capable of operating in analog simplex mode.*

9.3.1.5: *Trunked system talk groups shall not be used to fulfill the requirements of 9.3.1.3 and 9.3.1.4.*

## CONCLUSION

For the reasons set forth above, APCO supports the Commission's proposed requirements for Mask H compliance in the NPSPAC band, and adoption of Analog FM as the standard for 800 MHz, VHF, and UHF public safety mutual aid and interoperability channels.

Respectfully submitted,

/s/

Robert M. Gurss  
Senior Regulatory Counsel  
APCO International  
(202) 236-1742 (m)  
[gurssr@apcomail.org](mailto:gurssr@apcomail.org)

APCO Government Relations Office  
1426 Prince Street  
Alexandria, VA 22314  
(571) 312-4400

November 14, 2013