

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

In the Matter of)	
)	
Proposed Amendments to the Service Rules Governing Public Safety Narrowband Operations in the 769-775/799-805 MHz Bands)	PS Docket No. 13-87
)	
)	
The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010)	WT Docket No. 96-86
)	
)	
National Public Safety Telecommunications Council Petition for Rulemaking on Aircraft Voice Operations at 700 MHz)	RM-11433
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National Public Safety Telecommunications Council Petition for Rulemaking to Revise 700 MHz Narrowband Channel Plan)	RM-11433
)	
)	
Region 24 700 MHz Regional Planning Committee Petition for Rulemaking)	WT Docket No. 96-86 PS Docket No. 06-229
)	
State of Louisiana Petition for Rulemaking)	RM-11577

COMMENTS OF MOTOROLA SOLUTIONS, INC.

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COMMENTS OF MOTOROLA SOLUTIONS, INC.

Motorola Solutions, Inc. (“Motorola Solutions”) hereby submits the following comments in response to the Federal Communications Commission’s (“Commission”) Notice of Proposed Rulemaking on amendments to the Commission’s rules applicable to the 700 MHz public safety narrowband spectrum (769-775/799/805 MHz).¹

¹ See Proposed Amendment to the Service Rules Governing Public Safety Narrowband Operations in the 769-775/799-805 MHz Bands, *et al.*, PS Docket No. 13-87, *Notice of Proposed Rulemaking*, 28 FCC Rcd 4783 (2013) (“Notice”).

I. INTRODUCTION & SUMMARY

Motorola Solutions supports the Commission's proposals in the Notice that would adopt rule changes to promote spectrum efficiency, interoperability, and flexibility in operations in the 700 MHz public safety narrowband spectrum. Motorola Solutions has long advocated that the Commission initiate a comprehensive rulemaking proceeding to address various issues and proposals regarding the 700 MHz public safety narrowband spectrum and urges the Commission to proceed quickly in settling these issues.

Specifically, Motorola Solutions recommends that the Commission act on the proposals included in the Notice by:

- Extending by one year, to December 31, 2015, the effective date of the prohibition on the marketing, manufacture, or import of equipment not capable of operating in 6.25 kHz efficiency mode.
- Permitting public safety air-to-ground communications on 700 MHz secondary trunking channels.
- Revising the 700 MHz narrowband channel plan and service rules to promote innovation and efficiency by allowing new uses of the interoperability and reserve channels, and modifying the power limits applicable to the low power channels.
- Ensuring that the 700 MHz narrowband rules promote interoperability and maximize the utility of the spectrum with a minimum of complexity.

II. THE 6.25 KHZ NARROWBAND TRANSITION.

The Commission's rules currently require public safety narrowband licensees to operate with 6.25 kHz voice efficiency by December 31, 2016.² The rules also provide that manufacturers must cease marketing, manufacture, and import of 700 MHz narrowband equipment not capable of operating at 6.25 kHz efficiency by December 31, 2014.³ Since these rules were adopted, several parties have asked the Commission to extend the narrowbanding

² 47 C.F.R. § 90.535(d)(2).

³ 47 C.F.R. §§ 90.203(m)-(n).

deadlines in response to concerns related to equipment availability, transition costs, and spectrum availability.⁴ The Notice seeks comment on whether the Commission should extend or eliminate the schedule for mandated use of 6.25 kHz efficiency technology.⁵

Motorola Solutions acknowledges the need to maximize the efficient use of spectrum and further acknowledges that narrowbanding is one effective way of accomplishing that goal. However, the decision to maintain the previously adopted transition to 6.25 kHz efficiency for 700 MHz systems should involve additional considerations as well, such as cost and interoperability. Most importantly, the Commission must ensure that the transition will satisfy the operational needs of public safety. In this regard, the user community and the Regional Planning Committees are in a good position to determine whether the 2016 narrowbanding deadline should be maintained or whether changes should be made to the schedule. Motorola Solutions urges the Commission to give strong consideration to the recommendations of the user community when deciding whether to adjust the 2016 deadline.

Even if the Commission decides to extend the narrowbanding deadline, there are still benefits to be gained by requiring 700 MHz equipment to be capable of supporting 6.25 kHz efficiency. The availability of the greater efficiency mode would enable new and upgraded 700 MHz narrowband deployments to more efficiently utilize the limited spectrum available to the public safety community and address capacity challenges as they arise. Additionally, requiring the inclusion 6.25 kHz efficiency operations in devices in advance of any eventual mandatory

⁴ See, e.g., Petition for Rulemaking of the Region 24 700 MHz Regional Planning Committee, WT Docket No 96-86 (filed May 15, 2009); Petition for Rulemaking of the State of Louisiana, RM-11577 (filed Oct. 5, 2009); Petition for Rulemaking of Region 3 Public Safety Regional Planning Committee, PS Docket No. 06-229 (filed Mar. 21, 2012).

⁵ Notice, ¶¶ 86-91.

transition would allow equipment prices to decrease naturally as 6.25 kHz equipment penetrates the market.

Therefore, if the Commission does consider revising the narrowband deadline, Motorola Solutions believes that it should also extend by one year the effective date of the impending prohibition on marketing, manufacture, or import of 700 MHz narrowband equipment not capable of operating at 6.25 kHz efficiency. The added time would provide public safety the ability to better manage the transition to greater spectrum efficiency, while still supporting the backwards compatibility and interoperability that will be needed by existing networks that need greater time to leverage their existing equipment investment before such a transition becomes practical, and to better plan such a transition at the appropriate time. Additionally, licensees with 700 MHz narrowband systems that have been deployed exclusively with equipment that is capable of 12.5 kHz operation will only realize efficiencies and cost savings by being able to purchase additional equipment of the same type as is already installed. For example, cost savings are realized by purchasing devices that use the same batteries, chargers, and accessories as used by the legacy devices. Training expenses for new models can be deferred as well. Therefore, Motorola Solutions believes that a short extension of the deadline for marketing 12.5 kHz-only equipment would be helpful for public safety to better manage this transition by providing them with more time to assess their near-term needs and arrange funding for additional purchases.

III. PUBLIC SAFETY AIR-TO-GROUND COMMUNICATIONS ON SECONDARY TRUNKING CHANNELS.

The Commission should act promptly to grant the request of the National Public Safety Telecommunications Council (“NPSTC”) to allow public safety air-to-ground communications

on the 700 MHz secondary trunking channels.⁶ This petition was originally filed in 2010, and the record compiled on the petition and the State of Maryland's subsequent waiver request, as well as the actions of Maryland since the grant of its waiver, demonstrate that the issues identified by NPSTC remain of serious interest and that the proposed solution is viable. As Motorola Solutions has noted previously, the NPSTC proposal addresses a critical operational need to support public safety aircraft communications requirements in the 700 MHz band without interfering with ground-based public safety operations.⁷

Mobile air-to-ground use of these channels will preclude terrestrial reuse of the same channel(s) in the same area. Therefore, such use by an agency could impact use of the same spectrum in neighboring jurisdictions unless properly coordinated. The secondary trunking channels are more conducive for such operations than the more heavily-used general use 700 MHz narrowband channels. Even so, there will be a need for coordination between states and among geographically adjacent agencies within a state. This coordination can be facilitated through existing mechanisms, such as the Statewide Interoperability Executive Committees ("SIECs") and/or regional planning committees ("RPCs"). Since receiving its waiver grant, the State of Maryland has conducted extensive coordination with its neighboring jurisdictions and will be testing air-ground operations to ensure interference is not caused. With eight 12.5 kHz channel pairs available in the secondary trunking channels, there should be sufficient capacity to support shared use. Sharing will be further facilitated by the low power limit of two watts effective radiated power ("ERP") proposed for air-ground operations in the secondary trunking channels.

⁶ See Petition for Rulemaking of the National Public Safety Telecommunications Council, RM-11433 (filed Mar. 19, 2010).

⁷ Comments of Motorola Solutions, Inc. at 3, RM-11433 (filed July 15, 2011).

The two watts ERP power limit, along with the other protections applied to air-to-ground operations in the Commission's rules will also limit the potential for harmful interference to adjacent channel operations. Although, as discussed above, the trunking channels are adjacent to the interoperability channels, they also are adjacent to general use channels. A two watts ERP limit for airborne mobiles using P25 will enable robust communications while also limiting the potential for adjacent channel interference. Moreover, the Commission can provide added protection, as it did in the waiver granted to the State of Maryland, by applying to air-to-ground communication on the secondary trunking channels the interference protections of Section 90.423, including the requirement that air-to-ground operations accept interference from other licensees and not cause harmful interference to other licensees.⁸

IV. REVISIONS TO THE 700 MHZ NARROWBAND CHANNEL PLAN.

Several of the revisions to the 700 MHz narrowband channel plan and service rules proposed in NPSTC's 2008 Petition for Rulemaking⁹ and subsequent filings offer innovative ways to meet public safety operational requirements using the existing 700 MHz narrowband allocation and should be acted upon by the Commission. Specifically, Motorola Solutions supports innovative uses of the existing 700 MHz narrowband interoperability channels, consistent with coordination needs. Motorola Solutions also supports steps to operationalize the reserve channels, whether for temporary deployable operations in disaster situations or major incidents, or on a permanent basis when the additional spectrum is needed. Finally, Motorola Solutions also supports revisions to the rules applicable to the low power channels.

⁸ See State of Maryland Request for Waiver of 47 C.F.R. § 90.531(b)(7) to permit operation of Air-to-Ground radio equipment on 700 MHz Secondary Trunking Channels, RM-11433, *Order*, 27 FCC Rcd 10065, 10070 ¶ 17 (2012); see also 47 C.F.R. § 90.423.

⁹ Petition for Rulemaking of the National Public Safety Telecommunications Council, RM-11433 (filed Feb. 8, 2008) ("2008 NPSTC Petition").

A. Narrowband Interoperability Channels.

Consistent with the proposal above to allow air-to-ground use of the secondary trunking channels, the Commission should move forward with the proposal to make innovative use of two channel pairs each from the 700 MHz narrowband calling and data-only interoperability channels, consistent with operational requirements. Expanded use of these channels as proposed by NPSTC would address important public safety needs while still allowing sufficient capacity for interoperability communications. As NPSTC noted in 2008, consolidation of the 700 MHz narrowband channels makes it unnecessary and potentially confusing to continue setting aside four channel pairs each for narrowband calling and data-only interoperability operations.¹⁰ The additional flexibility inherent in the NPSTC proposal has long been desired by the 700 MHz narrowband user community, and the Commission should grant this request.

B. Narrowband Reserve Channels.

The Commission should take steps to release and operationalize the 700 MHz reserve channels, either for deployables or as permanent aspects of established 700 MHz narrowband systems. As the Commission notes, Section 90.531(b)(2) of the Commission's rules sets aside forty-eight 6.25 kHz channel pairs for future use.¹¹ Currently these channels remain unavailable, but there are multiple proposals before the Commission for how they can be productively deployed to service public safety communications needs. The Commission should not allow these channels to lie fallow where there is a demand for their use by the public safety user community.

The Notice discusses two proposals for use of the reserve channels. In its 2008 Petition for Rulemaking, NPSTC proposed redesignation of these channels for use by temporary

¹⁰ *Id.* at 5-7.

¹¹ Notice, ¶ 112; *see also* 47 C.F.R. § 90.531(b)(2).

deployable mobile trunked infrastructure that could be transported into an incident area to assist with emergency response and recovery.¹² More recently, the Los Angeles Regional Interoperable Communications System Joint Power Authority (“LA-RICS”) filed a request for waiver to integrate the 700 MHz reserve channels into the LA-RICS system as a replacement for T-Band channels expected to be repurposed pursuant to the Spectrum Act.¹³

The NPSTC and LA-RICS proposals are both innovative strategies for leveraging this valuable 700 MHz spectrum to support public safety communications needs. Using the reserve channels for rapid deployable infrastructure could be of great assistance during times of emergency where existing infrastructure is partly or completely compromised or insufficient for meeting requirements. Support by the Commission of this solution could encourage manufacturers to begin incorporating this functionality into deployable equipment. At the same time, where there is an immediate demand for these channels in established systems—such as in the LA-RICS system—they should be integrated. This is consistent with the original intent of the reserve channels which were set aside for “future expansion” of narrowband operations.¹⁴

Co-channel and adjacent channel interference concerns related to use of the reserve channels could be addressed in the same way as in the interoperability channels today. Operations on the reserve channels would be coordinated through the SIEC, RPC, or other applicable local/regional authority controlling interoperability channel assignment for the area.

¹² 2008 NPSTC Petition at 7.

¹³ Request for Waiver of Section 90.531(b)(2) filed by Los Angeles Regional Interoperable Communications System Joint Powers Authority (Dec. 7, 2012) (“LA-RICS Waiver Request”).

¹⁴ See Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152, ¶ 32 (1998).

This coordination process would apply both to temporary deployable use of the channels or to their integration to permanent systems.

C. Power Limits for Low Power Itinerant Interoperability Channels.

The Commission should act on NPSTC's proposal to increase the power limit for low power itinerant interoperability channels to enhance intelligibility and building penetration at emergency incidents, with some restrictions. For low power channels subject to regional planning pursuant to Section 90.531(b)(3),¹⁵ Motorola Solutions supports a 20 watts ERP limit for mobile devices but would propose limiting the corresponding antenna height to 20 feet AGL as is done in the UHF channels available for low power use.¹⁶ However, on the nationwide low power itinerant use channels, as set out in Section 90.531(b)(4),¹⁷ Motorola Solutions is concerned about an increase in interference potential between uncoordinated 20 watt ERP operations, even with a 20 feet AGL limitation.

Motorola Solutions also renews its request that the Commission replace its 2 watt ERP limit with a transmitter output power ("TPO") limit of 3 watts for mobile/portable devices designed to operate on all of the low power channels. This would be consistent with the 3 watt TPO limit generally applicable to all other 700 MHz narrowband mobile and portables.¹⁸ This modest increase in power output should enhance in-building performance and improve economies of scale for the manufacturing of 700 MHz devices by allowing a single output power limit of 3 watts to apply to all 700 MHz narrowband mobile and portable devices.

¹⁵ 47 C.F.R. § 90.531(b)(3).

¹⁶ 47 C.F.R. § 90.267.

¹⁷ 47 C.F.R. § 90.531(b)(4).

¹⁸ *See* 47 C.F.R. § 90.541.

V. MISCELLANEOUS ISSUES.

In the Notice, the Commission seeks comment on a variety of “Miscellaneous” issues related to its 700 MHz narrowband service rules. In addressing these issues, the Commission should strive to promote interoperability and maximize the utility of the 700 MHz narrowband spectrum with a minimum of complexity.

A. Project 25 Compliance Assessment Program (“P25 CAP”) Certification.

The Commission should not require vendors of 700 MHz narrowband equipment to obtain P25 CAP certification for all equipment prior to marketing or sale of such equipment. Interoperability is sufficiently served by the existing Section 90.548(a)(1) requirement that 700 MHz narrowband transmitters “shall include” a mode of operations conforming to the P25 standard;¹⁹ the remainder of the Commission’s device rules should remain focused on technical issues, such as power levels and interference protections, which have traditionally been the subject of equipment certification. P25 CAP is a voluntary program developed the Department of Homeland Security (“DHS”). As technology changes and the P25 standards evolve, new interoperable uses within the P25 standard might emerge and be adopted by the user community before DHS updates P25 CAP. By incorporating this third party program—which is not intended to be mandatory—as a prerequisite to marketing equipment under its rules, the Commission risks unintentionally stifling further development and adoption of advanced technologies by the 700 MHz narrowband community.

Moreover, it is also not clear that such a requirement is necessary or would be helpful. P25 CAP exists already and many manufacturers—including Motorola Solutions—regularly

¹⁹ 47 C.F.R. § 90.548(a)(1) (requiring P25 for operations on the 700 MHz nationwide interoperability channels). *See also* 47 C.F.R. § 90.547 (requiring mobile and portable transmitters operating on 700 MHz narrowband channels to be capable of operating on all of the nationwide narrowband Interoperability channels).

submit devices for P25 CAP testing without the need for a Commission mandate. In addition, 700 MHz narrowband system operators make purchasing decisions based on a number of factors, including, potentially, P25 CAP-certification. Indeed, many licensees already specify in RFPs for P25 CAP tested product to comply with DHS SAFECOM program grant guidelines.

Finally, because it was never intended to be a mandatory prior approval, the logistics of P25 CAP testing currently may not be compatible with such a requirement. P25 CAP testing includes much more functionality than is required to operate on the 700 MHz interoperability channels, and the CAP program does not require devices to pass each test, only that the tests are conducted and the outcomes publicly recorded. Therefore, making it a mandatory prior authorization would be inconsistent with the design of the program.

B. Narrowband Power Limits.

Motorola Solutions agrees that the Commission should eliminate Section 90.545.²⁰ That Section applied only to interference protection from narrowband operations to television receivers, and has been rendered moot by the transition of the television broadcast service from the 700 MHz band. Motorola Solutions does not agree, however, with the adoption of ERP limits for 700 MHz mobile and portable stations.²¹ From the perspective of manufacturing and certifying devices, devices without integral antennae should have power limits based on transmitter output power. In such devices, it is more practical and efficient to measure conducted power and adjacent channel power (“ACP”) relative to TPO than to ERP.

²⁰ Notice, ¶ 141.

²¹ *Id.*, ¶ 138.

Typically, portable devices and mobile stations with antenna height less than 6.1 meters (20 feet) have power limits defined in terms of TPO, not ERP. This is the case in the 800 MHz band, where mobile stations have a maximum TPO of 100 watts.²² Moreover, control stations with antenna height less than 6.1 meters typically should be treated similar to mobile stations.²³ Only control stations that exceed the 6.1 meter AGL rule need to be licensed separately and require ERP and antenna height limitations, as the greater antenna height increases the potential for harmful interference to geographically adjacent systems. As such, in consolidating Sections 90.541 and 90.545(b) (and taking into account NPSTC's and Motorola Solutions' proposals for the low power channels discussed above) the Commission should adopt rules consistent with the recommendations summarized in the following table:

Parameter	§ 90.541 (current)	§ 90.545(b)	§ 90.541 (proposed revs.)
Base Station Power	Based on § 90.635	1000 watts ERP	<i>Based on § 90.635</i>
Base HAAT	Based on § 90.635	Refers to § 90.309	<i>Based on § 90.635</i>
Control station power	30 watts TPO	200 watts ERP	<i>If AGL > 6.1 m, then 200 watts ERP; if AGL < 6.1 m, then 30 watts TPO</i>
Control station HAAT	N/A	61 meters	<i>61 meters</i>
Mobile station power	30 watts TPO	30 watts ERP	<i>30 watts TPO</i>
Mobile station ant. ht.	N/A	6.1 meters	<i>6.1 meters</i>
Portable station power	3 watts TPO	3 watts ERP	<i>3 watts TPO</i>
Regionally-coordinated low power channels (<i>see</i> 90.531(b)(3))	2 watts ERP	N/A	<i>20 watts ERP up to AGL 20 ft; 3 watts TPO</i>
Nationwide low power channels (<i>see</i> 90.531(b)(4))	2 watts ERP	N/A	<i>3 watts TPO</i>

²² 47 C.F.R. § 90.635(b).

²³ *See, e.g.*, 47 C.F.R. § 90.119(b).

C. Nationwide Narrowband Interoperability Channels.

Motorola Solutions supports the Commission's proposal to clarify that Section 90.547(a) requires only that radios be capable of being programmed to operate on all of the nationwide interoperability channels in the 700 MHz band, but that all such channels need not necessarily be simultaneously accessible to the user. Different agencies—or even groups within the same agency—likely will use different subsets of the interoperability channels. It serves the goals of interoperability and maintaining high quality communications equipment for radios to have the capability of operating on any of the channels, but there is no need for the radios to be pre-programmed with access to all of the channels, or to provide simultaneous accessibility to all channels.

D. Analog Operations on the Interoperability Channels.

The Section 90.548(a)(1) P25 obligation is essential to interoperability in the 700 MHz narrowband spectrum. As NPSTC noted in its September 2011 letter to the Commission, it is likely that the ambiguity created by the Section 90.535(a) permission of analog modulation as a secondary mode of operations was inadvertent, and that the Commission's intent was that interoperability channels would be operated in digital P25 mode only.²⁴ Nevertheless, so long as the mandate that 700 MHz narrowband devices include the digital P25 mode of operations is maintained, Motorola Solutions would defer to the appropriate SIEC, RPC, or other applicable local/regional coordinating authority to determine whether analog operations could also be conducted effectively and efficiently while preserving interoperability.

²⁴ See Letter from John S. Powell, Chair National Public Safety Telecommunications Council (NPSTC) Interoperability Committee to David L. Furth, Deputy Chief, Public Safety Homeland Security Bureau at 3, PS Docket No. 13-87 (Sept. 11, 2011).

VI. CONCLUSION.

Motorola Solutions appreciates the opportunity to participate in this proceeding. Various proposals in the Notice would promote spectrum efficiency, interoperability, and flexibility in operations in the 700 MHz public safety narrowband spectrum, and we look forward to continuing to work with the Commission as it moves forward to ensure robust use of the spectrum in ways that will best serve the critical communications needs of the public safety users.

Respectfully submitted,

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