

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

In the Matter of)
)
The Development of Operational, Technical)
and Spectrum Requirements for Meeting) WT Docket No. 96-86
Federal, State, and Local Public Safety)
Communication Requirements Through)
the Year 2010)
)
Establishment of Rules and Requirements)
for Priority Access Service)

**REPLY COMMENTS OF MOTOROLA IN RESPONSE TO THE
FOURTH NOTICE OF PROPOSED RULE MAKING**

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Summary

Commenters to the FCC's Fourth Notice of Proposed Rule Making addressing operational and technical standards for the 700 MHz public safety allocation were nearly unanimous in their support for the proposal to adopt Project 25 Phase I technology as the digital interoperability standard in the public safety 700 MHz band. Motorola therefore urges the FCC to move quickly so that the interoperability standard is established in the Rules by the end of November of this year. Further, the public safety community has offered a common sense transition plan to provide for the migration to 6.25 kHz equivalent technologies on a timely basis while allowing for the immediate use of the 700 MHz allocation where available. Motorola urges the FCC to adopt the proposed benchmarks as set forth in comments filed by APCO and the International Association of Chiefs of Police. Doing so will expedite the use of this spectrum to address critical public safety communications needs. Finally, Motorola recommends that the Commission act cautiously in mandating the use of industry-developed receiver standards to ensure interoperability.

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Motorola Inc., (Motorola) hereby submits these replies to comments filed in reference to the FCC's Fourth Notice of Proposed Rule Making in the above-captioned proceeding.¹ As further detailed below, the commenters have provided near unanimous support for the FCC's proposal to adopt Project 25 Phase I technology as the digital interoperability standard in the public safety 700 MHz band.² Therefore, the FCC should move quickly so that the interoperability standard is established in the Rules by the end of November of this year. Further, the public safety community has offered a common sense

¹ *In the Matter of The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State, and Local Public Safety Communication Requirements Through the Year 2010, Establishment of Rules and Requirements for Priority Access Service, WT Docket No. 96-86, Fourth Notice of Proposed Rule Making, FCC No. 00-271, released August 2, 2000 (Fourth Notice).*

² Project 25 Phase I is an ANSI-accredited public safety wireless communications protocol. Its key spectrum characteristics are a 12.5 kHz channel bandwidth, specification of C4FM modulation, and the use of Frequency Division Multiple Access (FDMA) channel access method.

transition plan to provide for the migration to 6.25 kHz equivalent technologies on a timely basis while allowing for the immediate use of the 700 MHz allocation where available. Motorola urges the FCC to adopt the proposed benchmarks as set forth in comments filed by APCO and the International Association of Chiefs of Police. Finally, Motorola recommends that the Commission act cautiously in mandating the use of industry-developed receiver standards to ensure interoperability.

I. The FCC Should Immediately Adopt Project 25 Phase I as the Technology Standard for Operations on the 700 MHz Interoperability Channels.

Based largely on the recommendation of the Public Safety National Coordinating Committee (NCC), the *Fourth Notice* tentatively concluded that the Commission should adopt Project 25 Phase I as the digital interoperability standard even though this would be contrary to the Commission’s preference to require 6.25 kHz technology immediately.³ In rationalizing this proposal, the *Fourth Notice* explained that a “substantial delay could result” should the FCC await the development of further 6.25 kHz standards efforts.⁴

In its opening round comments, Motorola strongly supported this tentative conclusion noting that further delay would be “contrary to the expressed desires of Congress to see this band used to mitigate existing public safety spectrum shortfalls.”⁵ Motorola also pointed out that in several reviews conducted over the past few years, the public safety user community has consistently concluded that Project 25 Phase I provides

³ *Fourth Notice* at ¶46.

⁴ *Id.* at ¶46.

⁵ *Comments Of Motorola In Response To The Fourth Notice Of Proposed Rule*

the best combination of features required by law enforcement, fire and other public safety “first respondents” while also providing a graceful migration path from legacy FM analog systems through multiple Project 25 Phase II digital platforms.⁶

These themes expressed by Motorola were echoed within most of the comments submitted in response to the *Fourth Notice*. Public safety interest groups and equipment manufacturers of all shapes and sizes almost universally concluded that Project 25 Phase I is uniquely qualified to serve as the digital interoperability standard now and in the future. A representative sampling of these comments is as follows:

Association of Public-Safety Communications Officials-International (APCO):

APCO obviously supports the Commission’s tentative decision to adopt Project 25 Phase I as the Interoperability standard for the 700 MHz Public Safety Band. Project 25 Phase I is a fully documented and approved ANSI/TIA standard that has undergone extensive review and consideration by the public safety community and manufacturers.⁷

Com-Net Ericsson Critical Radio Systems:

Com-Net Ericsson believes that the conventional Project 25, Phase I [Common Air Interface] does have sufficient spectral efficiency to satisfy public safety needs for the designated 700 MHz voice interoperability channels ... [W]e nevertheless consent to the NCC recommendation for the digital voice interoperability standard.⁸

Making, WT Docket No. 96-86, September 25, 2000, at 5.

⁶ *Id.* at 6.

⁷ *Comments of APCO in Response to the Fourth Notice of Proposed Rulemaking*, WT Docket No. 96-86, September 25, 2000, at 4.

⁸ *Comments of Com-Net Ericsson Critical /Radio Systems, Inc.*, WT Docket No. 96-86, September 25, 2000, at 13, 14.

Federal Law Enforcement Wireless Users Group (FLEWUG):

[T]he Commission has tentatively concluded that it will adopt the NCC recommendation regarding the adoption of Project 25 Phase I pending development of viable 6.25-kHz technology. The FLEWUG fully supports this course of action and rationale, citing the concerns of the NCC and the Commission that efficient use of spectrum should be balanced against practical, cost-effective solutions for public safety.⁹

The International Association of Chiefs of Police:

The IACP along with numerous other public safety organizations has studied and reviewed all the available information and has concluded that P-25 Phase I is the correct interoperable standard now and for the foreseeable future. It provides the proper bridge for the existing 800 MHz analog systems to the multiple different new technologies being proposed as Phase II systems.¹⁰

Kenwood Communications:

Kenwood agrees that the Phase I, 12.5 kHz standard should be adopted as an acceptable standard for the IOP channels. The record reflects that the NCC made sound and reasonable judgments in its recommendations in this respect.¹¹

North American TETRAForum:

NATF agrees with the Commission's recommendations of using Project 25, Phase I for Interoperability Channels with the one voice channel per 12.5 kHz of bandwidth.¹²

⁹ *Comments to the Fourth Notice of Proposed Rulemaking filed by the Federal Law Enforcement Wireless Users Group*, WT Docket No. 96-86, September 25, 2000, at 7.

¹⁰ *Comments of the International Association of Chiefs of Police in Response to Fourth Notice of Proposed Rulemaking*, WT Docket No. 96-86, September 22, 2000, at 3.

¹¹ *Comments of Kenwood Communications Corporation in Response to Fourth Notice of Proposed Rulemaking*, WT Docket No. 96-86, September 25, 2000, at 9.

¹² *Comments of North American TETRAForum (NATF)*, WT Docket No. 96-86, September 25, 2000, at 6.

State of California:

The State strongly supports adoption of Project 25 Phase I as the interoperability standard in the 700 MHz band for now and well into the future.¹³

State of Florida:

We believe that an initial Project 25 Phase I standard will allow the first implementation of 700 MHz to be accomplished at reasonable cost¹⁴

Motorola believes that this strong consensus in favor of adopting Project 25 Phase I as the 700 MHz interoperability standard should finally squelch the years of debate and acrimony over this decision. Federal users, state system operators, local jurisdictions and manufacturers have all reached the same conclusion that Project 25 Phase I is the best interoperability solution to meet user needs. Motorola therefore urges the FCC to adopt the recommendation of APCO that this issue be put to rest by the end of November, 2000, to allow manufacturers to complete the necessary design work and to allow public safety to begin using the spectrum as soon as possible to meet their critical needs.

The singular voice of opposition to establishing Project 25 Phase I as the voice interoperability standard was contained in a single set of comments (submitted by the American Association of State Highway and Transportation Officials, Forestry Conservation Communications Association, International Association of Fire Chiefs, Inc., International Association of Fish and Wildlife Agencies, International Municipal Signal

¹³ *Comments of the State of California in Response to Fourth Notice of Proposed Rulemaking*, WT Docket No. 96-86, September 25, 2000, at 13.

¹⁴ *Comments by the State of Florida to the Fourth Notice of Proposed Rulemaking*, WT Docket No. 96-86, September 25, 2000, at 5.

Association and National Association of State Foresters). These comments raise two principal objections to the adoption of Project 25 Phase I, namely, the purported loss of spectrum efficiency and speculation regarding equipment affordability. These comments further note that two alternative paths to Project 25 Phase I are available: interim analog operation with a reasonable phase out date or TETRA technology.

Motorola does not believe that these comments provide the FCC with any real alternatives to adopting Project 25 Phase I as the interoperability standard and that their criticisms of Project 25 Phase I are misplaced. First, the FCC has already rejected the alternative of allowing analog technology to serve as the baseline mode for interoperability – the preferred option for these commenters. Second, any concern about the reduced spectrum efficiency inherent in allowing Project 25 Phase I to operate on the interoperability channels is not supported by any facts presented in this proceeding. For example, Com-Net Ericsson specifically addressed this issue as follows:

[i]n view of the NCC discussions to date, it is hard to believe that thirty-two 12.5 kHz channel pairs will ever be insufficient to handle the envisioned interoperability direct unit to unit operations, using 12.5 kHz efficient, i.e. one voice path per 12.5 kHz of occupied bandwidth, equipment. Instituting a 6.25 kHz efficiency requirement at sometime in the future might double the capacity of an already sufficient number of channels, however, such capacity doubling may be coupled with increased technical concerns thereby reducing the suitability of all resultant sixty-four channel pairs.

Similarly, the Project 25 Technology Interest Group noted that simply doubling the channels does not necessarily result in a doubling of the number of *usable* channels for interoperability:

[w]ithin a given geographical area, there are only so many transmitters that can be put on the air. The effects of intermodulation and interference both dictate that more dense applications will need to look towards carrying more information in the same bandwidth (on a transmitter) instead of narrowing the bandwidth.

While this latter point could be construed to favor the use of a 25 kHz wide TDMA solution such as TETRA instead of Phase I, such a decision would ignore the fact that European TETRA is not interoperable with any public safety systems fielded in the United States. Further, as noted by the North American TETRAForum:¹⁵

NATF agrees with the Commission's current recommendation that conventional rather than infrastructure dependent trunked technologies should be used for Interoperability Channels. NATF agrees that trunking should not be mandated on interoperability channels because of the increased complexity experienced during emergency operations. Additionally, it is important for radios to be able to communicate when the infrastructure is not available

Such issues have led TDMA proponents to recommend interoperability using conventional Project 25 Phase I within the TIA Project 25 Phase II standards setting process.

¹⁵ *Comments of North American TETRAForum* at 6. Despite references to Motorola throughout the comments of North American TETRAForum, we would like to make it perfectly clear that Motorola is not a participant in this forum and did not have any involvement with the development of its comments. Indeed, Motorola strongly disagrees with many of the statements about the U.S. public safety operational environment that are contained in the comments of the North American TETRAForum.

The real concern of the Joint Comments appears to be the cost associated with Project 25 Phase I technology. Certainly, costs will be reduced as soon as the FCC finalizes these technical standards and thus enables manufacturers to compete to place more Project 25 Phase I equipped units in the field. As the Commission has already concluded, the likely alternative to adopting Project 25 Phase I is further study and further delay without guarantee that additional efforts will produce a more cost-efficient technology than the robust Phase I technology that is available today.

II. Motorola Supports the APCO Transition Plan for 6.25 kHz Equivalent Efficiency Technology.

The FCC's tentative decision to adopt the Project 25 Phase I standard was predicated on adopting a migration plan to 6.25 kHz interoperability technologies.¹⁶ The *Fourth Notice* sought comment on what factors should be considered in developing an appropriate time-frame for the transition plan and on the technical challenges that need to be overcome to meet any such adopted schedule.¹⁷

As noted above, the public safety community is nearly unanimous in its support for Project 25 Phase I as the appropriate standard for interoperability now and in the future. Lacking a suitable alternative, commenters argue that the FCC's focus on encouraging a migration of interoperability technology to 6.25 kHz equivalency is misplaced.¹⁸

¹⁶ *Fourth Notice* at 20.

¹⁷ *Id.*

¹⁸ *See e.g., Comments of the City of Mesa, Arizona* at 6.

In its comments, APCO stated that it generally agrees with the Commission that it would be desirable to provide incentives for users and manufacturers to move forward in the development and implementation of 6.25 kHz technology while maintaining Project 25 Phase I operation on the interoperability channels.¹⁹ APCO argues that the focus of this migration should be on technology used on the general use channels which constitute the largest portion of the 700 MHz public safety band and which will probably be exhausted well before the need for greater interoperability spectrum is required.²⁰ In consideration of these and other facts, APCO's plan would be implemented as follows:²¹

Step 1: Immediate adoption of Phase I as the interoperability standard

Step 2: As of December 31, 2006 or within 6 months following FCC notice that at least 15 of the top 20 metropolitan areas (and at least 7 of the top 10) have been cleared of all relevant co-channel and adjacent channel television stations, whichever is later, all newly type-accepted radios for voice use must have i) the capability to provide one-voice channel per 6.25 kHz and ii) Project 25 Phase I for the interoperability channels.

Step 3: In the top 50 metropolitan areas, all general use operations must be at 6.25 kHz by 10 years after the date established in Step 2 above. Interoperability channels would remain at 12.5 kHz with Phase I technology.

Step 4: Outside the top 50 metropolitan areas, all general use channels must be at 6.25 kHz by 15 years after the date established in Step 2 above. Rural areas could remain at 12.5 kHz operation indefinitely on a secondary basis.

Step 5: As of the date established in Step 2, the FCC should re-examine whether it is possible to establish a migration path for subsequent transition to a 6.25 kHz interoperability standard.

¹⁹ *Comments of APCO* at 5.

²⁰ *Id.*

²¹ *Id.* at 7-10. References to 6.25 kHz include both 6.25 kHz wide equipment and equivalent efficient technologies that have at least one voice path per 6.25 kHz

APCO's transition plan was fully supported in comments filed by the International Association of Chiefs of Police.²²

In contrast to APCO's plan, Com-Net Ericsson argues that the 6.25 kHz efficiency, *i.e.*, one voice path per 6.25 kHz of occupied bandwidth, should be mandated for voice operations in the general use and reserved portions of the band from the outset of its availability.²³ Com-Net Ericsson claims that compliant technologies are available today and there is no justifiable reason for not requiring 6.25 kHz efficiency for voice operations in the general use and reserved portions of the 700 MHz band.²⁴ These views were supported by the comments of the North American TETRAForum who stated that allowing one voice channel per 12.5 kHz will potentially reduce by half the number of available channels and severely limit the number of public safety agencies that can operate in the 700 MHz band.²⁵

As noted in the comments submitted by FLEWUG, in adopting technical standards for public safety technologies, it is appropriate for the FCC to balance spectrum efficiency with ensuring that practical, cost-effective solutions are available for public safety users.²⁶ At issue in the *Fourth Notice* is the efficiency standard appropriate for the interoperability

²² *Comments of the International Association of Chiefs of Police*, WT Docket No. 96-86, September 22, 2000, at 3-5.

²³ *Comments of Com-net Ericsson* at 18. Current FCC rules specify that general use equipment is only required to maintain a data throughput rate of at least 4800 bits per second per 6.25 kHz. *See* 47 C.F.R. §90.535(b).

²⁴ *Id.*

²⁵ *Comments of North American TETRAForum* at 5.

²⁶ *Comments of FLEWUG* at 7.

channels. To that end, the FCC is correct in its tentative conclusion that Com-Net Ericsson's recommendation for a one voice path per 6.25 kHz standard would result in a "negation" of the NCC's recommendation to use the Project 25 Phase I standard for interoperability. The FCC should quickly adopt that tentative conclusion.

Com-Net Ericsson and the North American TETRAForum intend to turn that tentative conclusion around and instead have the efficiency standard apply immediately to the general use channels and the reserved portion of the 700 MHz band. This recommendation, if adopted, would similarly serve to negate the use of Phase I technology on the general use channels and delay public safety use of this spectrum. Motorola opposes such a proposal because of its impact to public safety users seeking to make immediate use of this spectrum.

Permitting the use of Project 25 Phase I technologies access to the general use channels, even on a basis consistent with the plan submitted by APCO, will expedite the deployment of public safety systems in markets where no broadcast facilities currently block public safety access to the 700 MHz band. An example of such an area is Arizona, where the City of Mesa will partner with the City of Phoenix and other jurisdictions to deploy a state-wide 700 MHz system using Project 25 Phase I technology.²⁷ Relying on Project 25 technology will allow the Arizona system to integrate both 700 MHz and 800 MHz bands within 18 months, something that no other technology can now offer.²⁸ If the FCC adopts a efficiency standard that prohibits the use of Project 25 Phase I on the

²⁷ *Comments of the City of Mesa, Arizona* at 6.

general use channels, the Arizona project will go back to the drawing board and will be delayed for years to come.

Maintaining the ability of Project 25 Phase I technology to access the general use channels will provide additional manufacturing economies of scale that will alleviate costs associated with deploying the technology for interoperability purposes. Therefore, rather than responding to the unbalanced proposals of Com-Net Ericsson and the North American TETRAForum, the FCC should instead follow the recommendations of the public safety community and allow 12.5 kHz technologies to be deployed. Linking the transition to 6.25 kHz technologies to the removal of incumbent broadcast facilities will ensure that significant levels of capacity will remain open for future technologies while allowing those users that can deploy now the option to use the technology best suited for public safety needs.

III. Receiver Standards.

Many public safety organizations support the adoption of receiver standards to ensure a more robust operational environment and minimize potential interference. FLEWUG, for example, indicates its supports for receiver standards for all 700 MHz public safety equipment and notes that within the NCC, the standard ANSI/TIA/EIA TSB102.CAAB-1994 Digital C4FM/CQPSK Transceiver Performance Standard is currently under consideration for the 700 MHz band receiver standard.²⁹

²⁸ *Id.* at 7.

²⁹ *Comments of FLEWUG* at 10.

Motorola believes that the FCC should only require compliance with the above-mentioned standard for operations on the interoperability channels. That standard is relevant to 12.5 kHz Project 25 Phase I technology which, assuming the FCC enacts its tentative conclusions, will be the standard for the interoperability channels only. Development of applicable receiver standards for alternative technologies will take time to finalize and such activity will result in further delays in Project 25 Phase I system deployment. To the maximum extent possible, the FCC should strive to rely on industry developed standards and manufacturers' self-certifications rather than referencing specific standards in its rules.³⁰ Requiring notice and comment rule proceedings to modify such requirements will likely chill future improvements in receiver design.

³⁰ Chairman Kennard shared these same sentiments at a recent industry function. See, *"Spectrum: The Space Odyssey" Remarks of William E. Kennard Before the Industrial Telecommunications Association, Washington, D.C. October 5, 2000*, ["Industry guidelines on receiver quality, coupled with voluntary product labeling, would go a long way towards giving consumers the information they need."]

IV. Conclusion.

For the reasons expressed above, Motorola urges the FCC to act quickly on its tentative decision to adopt Project 25 Phase I technology as the 700 MHz narrowband interoperability standard. Such action will enable expedited utilization of the 700 MHz band and provide interoperability solutions well into the future.

Respectfully Submitted,

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