

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Former Nextel Communications, Inc.)	WT Docket No. 06-169
Upper 700 MHz Guard Band)	
Licenses and Revisions to Part 27 of)	
the Commission's Rules)	
)	
Development of Operational,)	WT Docket No. 96-86
Technical and Spectrum)	
Requirements for Meeting Federal,)	
State and Local Public Safety)	
Communications Requirements)	
Through the Year 2010)	

**COMMENTS OF THE NATIONAL PUBLIC SAFETY
TELECOMMUNICATIONS COUNCIL**

The National Public Safety Telecommunications Council (NPSTC) submits these Comments in response to the Commission's Notice of Proposed Rulemaking (NPRM) addressing possible changes to the Part 27 service rules for the Upper 700 MHz Guard Band.¹ NPSTC urges the Commission to address the structure and service rules of the 700 MHz guard band spectrum and that of the 700 MHz public safety band at the same time. A proposal of guard band licensees relates to the public safety segment, which in turn affects the technical parameters of the guard band.

NPSTC supports the proposal by guard band licensees that public safety communications be allocated additional spectrum in the 700 MHz band and urges interested parties to work with the Commission to pursue a positive resolution of the

¹ In the Matter of Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commissions Rules, WT Docket No. 06-169 and 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, *Notice of Proposed Rulemaking* (NPRM), FCC 06-133 (September 8, 2006).

contingencies that remain. One contingency noted by NPSTC involves the aspect of the proposal that requires moving the narrowband voice channels and ensuring that the associated costs are not borne by public safety. Interested parties are working to resolve this contingency. The other contingency, which emanates from the guard band licensees, is eliminating the cellular architecture prohibition in guard band operations and substituting a power flux density (PFD) limit on transmissions. NPSTC believes that a PFD limit can be a workable protection against adjacent channel interference.

In the absence of adopting the guard band licensees' proposal, the Commission should adopt the NPSTC model for broadband/wideband operations in the public safety segment and maintain the current technical rules addressing the guard band.

The National Public Safety Telecommunications Council

NPSTC serves as a resource and advocate for public safety organizations in the United States on matters relating to public safety communications. NPSTC is a federation of public safety organizations dedicated to encourage and facilitate through a collective voice the implementation of the Public Safety Wireless Committee (PSWAC) and the 700 MHz Public Safety National Coordination Committee (NCC) recommendations. NPSTC explores technologies and public policy involving public safety agencies, analyzes the ramifications of particular issues, and submits comments to governmental bodies with the objective of furthering public safety communications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications. The following thirteen organizations participate in NPSTC:

American Association of State Highway and Transportation Officials

American Radio Relay League
American Red Cross
Association of Fish and Wildlife Agencies
Association of Public-Safety Communications Officials-International
Forestry Conservation Communications Association
International Association of Chiefs of Police
International Association of Emergency Managers
International Association of Fire Chiefs
International Municipal Signal Association
National Association of State Emergency Medical Services Officials
National Association of State Telecommunications Directors
National Association of State Foresters

Several federal agencies are liaison members of NPSTC. These include the Department of Agriculture, Department of Homeland Security (SAFECOM Program and the Federal Emergency Management Agency), Department of Commerce (National Telecommunications and Information Administration), Department of the Interior, and the Department of Justice (National Institute of Justice, Office of Science and Technology – CommTech Program).

Overview

Licensees in the 700 MHz guard band, seeking a better return on the capital invested, are pursuing amendments to the Commission’s rules to allow broader and more flexible use of the spectrum. The Commission notes that there are few systems operating in the spectrum. The continued encumbrance by broadcasters and the limited availability

of equipment are noted as factors.² Licensees seek rules that will facilitate broadband deployment.

Current guard band rules are premised on protecting adjacent public safety communications; any revisions must uphold this fundamental premise. NPSTC's review has focused on the proposal of guard band licensees Access Spectrum, L.L.C and Pegasus Communications Corporation and others (Access Spectrum/Pegasus)³. The proposal reconfigures the public safety portion of the 700 MHz band, including relocating the narrowband voice channels, and allocating additional spectrum to public safety operations in the 700 MHz band to promote broadband and wideband operations. In exchange, Access Spectrum/Pegasus seek greater flexibility, both administratively and technically, for their operations in the 700 MHz guard bands.

NPSTC's review is based on the following factors. The first is balancing the benefits gained from the additional spectrum for broadband/wideband operations in the public safety segment against the costs and challenges of moving the narrowband voice channels. The second is whether operations under the proposed revised guard band rules will protect public safety operations. Absent reconfigured public safety and guard band segments as proposed by Access Spectrum/Pegasus, NPSTC sees little to be gained by revisiting the robust debate that established the guard band rules. The record does not substantiate such reexamination.⁴

² NPRM at paragraph 13.

³ Comments of Access Spectrum, L.L.C., Columbia Capital III, LLC, Intel Corporation and Pegasus Communications Corporation, In the Matter of the Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements through the Year 2010, *Eighth Notice of Proposed Rulemaking*, WT Docket 96-86 (June 6, 2006) ("Eighth Notice of Proposed Rulemaking, WT Docket 96-86").

⁴ NPSTC Reply Comments, July 6, 2006 at page 10, *Eighth Notice of Proposed Rulemaking*, WT Docket 96-86.

The 700 MHz Band Plans for the Public Safety Segment

The 700 MHz guard band was intended to protect operations in the adjacent public safety segment while also providing effective communications opportunities. The Commission's decision addressing whether the guard band's structure and service rules should be revised depends in many respects on the size of and operations within the public safety segment. There are several proposals addressing broadband and/or wideband opportunities within the public safety segment that ultimately affect how the guard band rules should be shaped. Proposals from NPSTC, Lucent Technologies (Lucent), and Access Spectrum/Pegasus have been presented.

NPSTC recommended that the current reserve, general use, and interoperability wideband channels of the 700 MHz public safety segment be restructured to allow local agencies, in coordination, with the Regional Planning Committees, to offer wideband and/or broadband applications.⁵ The foundation of the NPSTC model is that local public safety agencies, in coordination with the Regional Planning Committee, have the flexibility to respond to a region's communications needs. The substantial additional infrastructure costs accompanying broadband deployment would effectively make 700 MHz inaccessible to many agencies. The NPSTC model recognizes the vastly different needs across the country—rural, suburban, and urban—and relies on the regional planning process and frequency coordination to provide the range of agencies the opportunity to use the spectrum for either wideband or broadband purposes.

Lucent proposed that the 700 MHz band be restructured to facilitate broadband deployment. The Lucent plan would convert all wideband spectrum to broadband with

⁵ The NPSTC model evolved from an analysis of several proposals, including that of Motorola, Inc. *Ex Parte* Letter from Steve B. Sharkey, Motorola, WT Docket Nos. 96-86 and 05-157 (filed December 9, 2005). Much of the underlying data submitted by Motorola is applicable to the NPSTC model.

guard bands of 1.125 MHz. It proposed that the Commission adopt a single, commercial broadband technology standard for public safety communications and that standard should be EV-DO because of its technical characteristics and market maturity. NPSTC expressed concern regarding an all broadband proposal as it removed discretion from local agencies to pursue both wideband and broadband opportunities.⁶

Under the Access Spectrum/Pegasus proposal, the current 4 MHz B Block guard band would be eliminated, with 3 MHz placed in the public safety segment and 500 kHz paired channels placed in the A Block guard band, which will be relocated adjacent to the spectrum added to the public safety segment. This spectrum comes from two sources. Of the 52 B Block licenses, 42 are held by the Commission as a result of the 800 MHz reconfiguration Order, having originally been licensed to Nextel. The remaining 10 licenses are held by Access Spectrum, Pegasus, and others, who will seek compensation for relinquishing these licenses.

In the Access Spectrum/Pegasus proposal, the C and D Blocks remain the same size yet are relocated 1 MHz lower in the band plan. The C Block would be 746-751 MHz and 776-781 MHz; the D Block would be 751-761 MHz and 781-791 MHz. The Access Spectrum/Pegasus proposal requires consolidating the narrowband voice operations at the upper end of the 700 MHz public safety segment by relocating these channels from the current location.

The proposal would increase the public safety segment by 3 MHz. It would allow a 5.5 MHz block of paired spectrum to be used, instead of the 3.75 MHz proposed under the NPSTC proposal, for broadband or wideband operations. The restructuring would in many respects move the responsibility to promote compatibility between

⁶ NPSTC Reply Comments, *Eighth Notice of Proposed Rulemaking*, at 4.

broadband/wideband and narrowband operations within the public safety segment to public safety. The A Block guard band would remain adjacent public safety broadband/wideband operations while the C Block would be adjacent to narrowband operations.

The Access Spectrum/Pegasus proposal is inextricably linked to the issues the Commission seeks comment upon in the NPRM. Detailed below is a reiteration of NPSTC's position with regard to the proposal and its analysis of the changes proposed to the guard band technical and service rules.

The Costs of the Access Spectrum/Pegasus Proposal

The Access Spectrum/Pegasus proposal is meritorious. It would allocate 3 MHz more spectrum and provide more flexible and effective broadband/wideband operations for public safety communications. NPSTC's reticence to embrace it fully is based on the costs surrounding relocating the current public safety narrowband voice channels. The cost areas involved are: 1) Reprogramming existing equipment, 2) the extent of narrowband channels that would no longer be available along the northern border, and 3) the sunk costs associated with planning deployment of the narrowband channels and the resources needed to revise this work.

The record indicates that there are more than 600,000 mobile and portable radios currently operating at 800 MHz that were manufactured also to be used in the 700 MHz band. An initial concern is what the change in the location of the narrowband voice channels means with regard to each radio. Motorola, in a recent *ex parte* submission relates that there will be no incremental costs for those users not yet operating these dual

and radios at 700 MHz if the narrowband channels are relocated.⁷ Motorola states that the work needed to deploy the radios in the 700 MHz band involves “simple code plug programming” that would otherwise be performed to make the equipment operational. Motorola also notes that translation of any base stations in operation in the 764-767 MHz narrowband segment to the new narrowband block would be comparable to tuning channels for any system development. Motorola states that no hardware/firmware change would be needed. The change would involve work of the Regional Planning Committees, frequency coordinators and the Commission. There would also be technician time to adjust and tune filters to the new frequencies.

The costs of moving the narrowband block as proposed appear to be significantly less than originally noted. Yet, the Commission’s inquiry should determine whether a consensus exists regarding the ease of translation among all manufacturers that have sold 700 MHz radios and how any costs, even nominal, will be funded. NPSTC believes that none of these costs should be absorbed by public safety agencies for using current radios in the relocated voice segment.

Of other cost areas implicated by relocating the narrowband channels, the most prominent and vexing is the agreement the United States negotiated with Canada addressing how the 700 MHz band is shared in the border areas.⁸ That agreement is premised on the current band plan. As Canada has no definitive plan to move broadcast operations from channels 64 (770 MHz-776 MHz) and 69 (800 MHz -806 MHz), and

⁷ *Ex Parte* Letter from Steve B. Sharkey, Motorola, WT Dockets Nos. 96-86, 06-150 and 06-169 (dated October 4, 2006).

⁸ Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the frequency Bands 764 to 776 and 794 to 806 MHz by the Land Mobile Service Along the Canada-United States Border, Arrangement G Land Mobile (Public Safety Services (June 20, 2005) at http://www.fcc.gov/ib/sand/agree/can_nonbroad_agree.html

current rules require deference to these operations, agencies along the border will not have access to some number of the relocated narrowband voice channels. There is also the need to preserve narrowband interoperability relationships with Canadian agencies. NPSTC notes that several interests, including its representatives and those of New York State, are examining these issues in an effort to bring about a favorable resolution.

Additionally, there are agencies that are operating or commenced procurement of equipment in the 700 MHz band. The Commission's dockets indicate at least three major projects. Hennepin County, Minnesota, the State of New York, and the National Capital Region have submitted proposals to use the 700 MHz band, all of which detail particular technologies and equipment. Additionally, several agencies are using the equipment under the 700 MHz state licenses and there is no definitive record of what is in use. Changing the location of the narrowband channels on equipment already purchased and operating will impose costs. Agencies who have initiated operations in the 700 MHz must be compensated for the costs of relocation.

Costs also include the resources and effort already committed to structuring and using the narrowband channels and the work that will have to be replicated. The work includes planning the assignment of narrowband channels and the expense of revising the CAPRAD 700 MHz database. There is also the extensive work that been committed to regional plan preparation. These costs will have to be absorbed; NPSTC remains concerned regarding the affect on local agencies.

In NPSTC's view, resolving these cost issues is integral to revising the service rules for the 700 MHz guard band spectrum and must precede changes in the guard band service and technical rules. Absent what would be a new structure for both the public

safety and guard band segments and that any analysis of protecting public safety operations commences with new predicates, there is no reason to renew the extensive debate that culminated in the current guard band service rules. The Commission made definitive decisions based on an extensive record. If these cost issues are resolved, NPSTC's analysis of the guard band proposals follows.

Guard Band Manager Status and Eligibility

In the NPRM, the Commission asks whether it should substitute the Guard Band Manager model with what it refers to as the Secondary Markets model. The Secondary Markets model permits a licensee two types of leasing options, *de facto* transfer leasing and spectrum manager leasing. A *de facto* transfer lease arrangement places primary responsibility upon the lessee to ensure compliance with Commission rules. Under the second option, spectrum manager leasing, the licensee retains *de facto* control over the leased spectrum. Both of the Secondary Markets options require Commission filings through the Universal Licensing System (ULS) that include detailed information on the amount, frequency, and geographic location of each lessee's spectrum, as well as the length of the lease and whether the lessee has any overlapping spectrum interests.

NPSTC believes that whatever model the Commission embraces should reflect an accountable entity capable of responding to inquiries from public safety agencies and frequencies coordinators and comprehends that the purpose of the guard band is protecting public safety operations. The obligation under current rules to notify public safety frequency coordinators regarding a new station or a modification of a station and allowing a ten day review period is critical.⁹ It is vital that an accountable entity be accessible through the Commission's public data base and the parameters of operations

⁹ Section 27.601(b) of the Commission's Rules.

also be publicly available.

NPSTC opposes the Commission's suggestion that a guard band licensee select from several regulatory models. Varying models with different obligations on varied parties will dilute responsibility in the individual circumstance. As the Commission notes, the guard band administrative structure must continue to fulfill the primary responsibility of ensuring non interference with the public safety segment.

Removal of Cellular Architecture Prohibition

Under current rules operations in guard band blocks A and B are subject to adjacent channel power (ACP) restrictions and may not use cellular architecture. Operations in the C & D Blocks, which are separated from public safety operations by at least 1 MHz, have no cellular architecture prohibition or ACP restrictions. Operations are subject to out-of-band emissions ("OOBE"), antenna height, and transmission power limitations. Access Spectrum/Pegasus, in seeking to provide broadband service in the remaining A Block guard band, advocates that the cellular architecture prohibition and ACP restriction be eliminated.

Access Spectrum/Pegasus states that with the additional 3 MHz, public safety operations can structure an adequate channel separation to protect narrowband voice operations. It believes that the current restrictions of the C and D Blocks will protect public safety broadband and wideband operations. Access Spectrum/Pegasus states that the imposition of a power flux density limit (PFD), combined with improved public safety receiver quality, will permit cellular architecture to be used in guard band Block A.

PFD is the power crossing a unit of space in the direction of the radio wave's propagation. It is the rate at which electromagnetic energy flows through that surface and

provides a measure of interference potential to adjacent channels. The question is whether imposing a PFD restriction on guard band licensees adequately substitutes for prohibiting cellular architecture entirely. The inquiry is whether a well-defined, comprehensible PFD can be established to afford effective protection to public safety operations and is able to be applied to narrowband, wideband, and broadband operations within 700 MHz. Access Spectrum/Pegasus proposes a PFD limit allowing guard band licensees to operate base stations at power levels of 25 microwatts per square meter to within 1 kilometer of the transmitting base.

Advocates of PFD state that the likelihood of adjacent channel interference to ground-based devices on adjacent channels can be effectively limited; the PFD will limit the energy received by such devices. What the Commission has done in other contexts to promote compatibility among services is impose a PFD requirement on licensees operating at higher power levels. These base stations cannot operate at levels where transmissions from their base station antenna produce PFD levels that exceed the PFD levels the adjacent channel device would ordinarily receive.

NPSTC believes that PFD can serve as a workable protection to adjacent channel operations, broadband, wideband, and narrowband. A combination of OOBE and PFD limits can offer better protection against adjacent and off channel interference from the upper 700 MHz guard bands- along with a restriction on TDD operations. The flexibility it affords to guard band licensees must be tempered by the reality that even high standard receivers cannot both perfectly pass a desired signal while rejecting all unwanted signals.¹⁰ There must be a demonstration that PFD will prevent harmful interference to public safety systems. NPSTC will continue to analyze whether a standard can be

¹⁰ NPRM at paragraph 32.

precisely defined and understood so that it can be effectively implemented to protect public safety operations in the 700 MHz band.

In addition to substituting a PFD model for the prohibition on cellular architecture, the Commission inquires whether use of PFD will substitute for existing frequency coordination. NPSTC opposes the elimination of the current coordination and notification requirements. Public safety communications reliance on the frequency coordination system is well established. It has avoided intractable disputes before the Commission, promoted effective use of the spectrum, and, most significantly, prevented interference to public safety communications and other services. This is particularly critical because NPSTC believes that local agencies be provided the discretion to pursue broadband or wideband deployments. Frequency coordination is an important factor in enabling this choice. There is no record that the PFD model is any substitute for such protection.

Adjacent Channel Power (ACP)

The Commission's rules impose on the guard bands a different interference protection standard called Adjacent Channel Power (ACP) limits. The Commission applied this standard because of the susceptibility of public safety receivers to interference not only from out-of-band energy that falls within its passband, but also from energy from unwanted emissions located *outside* its passband—energy that can cause interference to the operation of the receiver. ACP limits differ from OOBE limits in requiring several different power attenuation levels at specific points displaced from the center frequency of a channel directly adjacent. OOBE limits require that out-of-band signal power be attenuated to ensure that the maximum out-of-band signal power

maintains an established, constant relation to the transmitter power.

Access/Pegasus, seeking to deploy broadband in the guard bands, notes that the ACP limits do not contemplate larger channel sizes, such as a broadband 1.25 megahertz channel. They contend that the ACP requirements should be replaced by protections that are designed to address emissions from channels of other bandwidths, including broadband channels. Access/Pegasus recommends that the Commission replace the ACP limits with the OOBE limits currently applicable to the C and D Blocks. They state that the level of OOBE protection for public safety would be greater than the level of protection under the current ACP requirement.

NPSTC believes precisely defined and understood OOBE limits tailored to particular operations in the public safety band, voice, wideband, or broadband, can bring clarity to the rules. The challenge is defining these parameters for each environment.

Allocation of the Returned Nextel Spectrum for the Public Utility Industry

In the absence of restructuring both the guard band and public safety segment of the 700 MHz band, where public safety will be allocated an additional 3 MHz, the Commission requests comment on the disposition of spectrum associated with the 42 700 MHz guard band licenses returned to the Commission by Nextel as part of the 800 MHz reconfiguration. Under the Access Spectrum/Pegasus proposal, this spectrum constitutes a substantial part of public safety's additional allocation. An alternative proposal allocates this spectrum to critical infrastructure industries, to be used in part for interoperability with public safety agencies.

NPSTC opposes allocating the returned Nextel spectrum to the public utility industry. There is no industry or sector that cannot effectively use additional spectrum,

particularly with the propagation character of the 700 MHz band. Yet there is no sector that requires spectrum more desperately than local and state public safety agencies. Despite the importance of the allocated 24 MHz in band, public safety's needs remain substantial and the returned Nextel channels would provide tangible improvement to public safety operations. If the Commission determines not to restructure the 700 MHz guard and public safety segments, the Nextel returned spectrum should be allocated to the public safety service.

Conclusion

NPSTC urges the Commission to examine proposals to restructure the 700 MHz guard band and the public safety segments together. The underlying premise that guard band operations must protect public safety operations must continue to resonate. The proposal to provide public safety communications an additional 3 MHz spectrum will assist public safety communications significantly yet agencies should not be burdened by the costs associated with such restructuring. Any amendments to the technical service rules for the guard band segment must provide definitive standards that adequately protect public safety communications.

Respectfully submitted,

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