

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

In the Matter of)
)
The Development of Operational, Technical) WT Docket 96-86
and Spectrum Requirements for Meeting)
Federal, State and Local Public Safety)
Communications Requirements Through the)
Year 2010)

COMMENTS OF PEGASUS COMMUNICATIONS CORPORATION

PREFACE

Pegasus Communications Corporation (“Pegasus”)¹ is taking the unusual step of filing two sets of comments in this proceeding – one in concert with Access Spectrum, LLC, Intel Corporation , and Columbia Capital Partners III, LLC (collectively the “Joint Commenters”) -- and one here. We have previously argued to the Commission that it has framed this proceeding too narrowly by deferring to future proceedings the proposals presented in the White Paper that we jointly submitted with ASL and other A and B Block licensees last year. We reiterate here our belief that the proposals set forth in our White Paper are superior to the current configuration, and wish, at a minimum, to preserve a fair opportunity for their consideration in the future proceedings that the Commission has promised to conduct. However, since the Commission has chosen to limit the scope of this proceeding to questions confined to the Public Safety allocation in the Upper 700 MHz spectrum, we consider it necessary to put before the Commission a proposal (the

¹ Pegasus Communications Corporation (“Pegasus”) holds 32 licenses in the A Band in the Upper 700 MHz, including licenses to operate in major economic areas (“MEAs”) such as Boston, Chicago, Detroit, New York City, Philadelphia, Pittsburgh, Portland, San Francisco/Oakland, and Seattle. It also holds two B Band licenses.

“Pegasus Proposal”) that can be considered within the narrow confines of this proceeding which will not prejudice the Commission’s future consideration of our White Paper Proposals,

We emphasize that the Pegasus Proposal set forth herein, should not be construed to contradict or detract from our full support of the Joint Commenters’ comments submitted separately. For all of the reasons articulated in the Joint Commenters’ comments, we believe that the rebanding proposal presented there is the right vision for the Upper 700 MHz spectrum. It approaches the Commission’s stated spectrum policies of grouping like uses, encouraging flexibility in uses of licensed spectrum, encouraging hybrid Public Safety/commercial networks and freeing more spectrum for Public Safety broadband comprehensively and achieves those goals in an elegant and efficient manner. It is clearly superior to the NPSTC Proposal described in the NPRM.

However, in the event, that the Commission declines to broaden this proceeding to enable consideration of the Joint Commenters’ Proposal, we urge adoption of the Pegasus Proposal. The Pegasus Proposal is also clearly superior to the NPSTC Proposal, and unlike the NPSTC Proposal, will not prejudice further optimization of the Upper 700 MHz in future proceedings.

THE PROPOSALS OF NPSTC, THE JOINT COMMENTERS AND PEGASUS

Approximately five months ago, the Commission submitted a report to Congress pursuant to Section 7502 of the Intelligence Reform and Terrorism Prevention Act of 2004 setting forth the following principal findings:

- “Emergency responders would benefit from the development of an integrated, interoperable national network capable of delivering broadband services throughout the country.
- While commercial wireless technologies are not appropriate for every type of Public Safety communication, there may be now a place for commercial providers to assist Public Safety in securing and protecting the homeland...
- Mobile, broadband communications, implemented in combination with upgraded equipment, associated training and close coordination, could offer emergency response providers many important capabilities.”²

While the current proceeding is a direct result of the Commission’s December 2005 Report to Congress, the NPSTC Proposal set forth in this proceeding appears to ignore or conflict with the principal findings of that report.

The NPSTC Proposal falls short of the objectives set forth in the Commission’s December 2005 Report to Congress in at least the following respects:

- It sets aside only 7.5 MHz for Public Safety broadband. This represents less than one third of the existing Upper 700 MHz Public Safety allocation.
- To accomplish this, it wastefully requires that 10 MHz of the Upper 700 MHz spectrum be set aside for guard bands to protect Public Safety narrowband spectrum.

² *Report to Congress on the Study to Assess Short-Term and Long-Term Needs for Allocations of Additional Portions of the Electromagnetic Spectrum for Federal, State and Local Emergency Response Providers*, 2005 FCC LEXIS 6907, ¶ 47 (Dec. 19, 2005)

- It prevents future development of Public Safety/commercial “mixed use” networks, because it places Public Safety narrowband between the Public Safety and commercial broadband allocations.
- It provides for broadband channel widths of only 1.25 MHz, which are too small to enable fourth generation (“4G”) broadband technologies such as WiMAX and UMTS TDD.

There are significant direct and indirect costs to implementing the NPSTC Proposal.

The direct costs stem from the allocation of valuable Upper 700 MHz spectrum to guard bands rather than to its highest and best use as spectrum for mobile broadband. In substance, the NPSTC Proposal taken together with existing regulations would require setting aside 10 MHz of the Upper 700 MHz in order to protect 12 MHz of Public Safety narrowband. Put another way, if the NPSTC Proposal is adopted, 37% of the Upper 700 MHz will be permanently dedicated to relatively low value use rather than to use for mobile broadband. The Brattle Group analysis (included as Appendix A) indicates that the market value of public safety spectrum under the NPSTC plan is approximately \$816 million less than the market value of the same Public Safety spectrum configured under the plan put forward in these comments (the “Pegasus Proposal”).

The indirect costs result from the future inability of Public Safety to take advantage of 4G technologies and of the operational and capital cost savings that could derive from Public Safety/commercial “mixed use” networks. While we have not made an effort to quantify the indirect costs in these comments, we believe that they match or exceed the direct costs set forth in the Brattle Report.

Of course, the direct and indirect costs represent only a portion of the public welfare loss that would result from implementation of the NPSTC Proposal. It has been estimated, as recounted in the Joint Commenters' comments, that increased spectrum value represents only 5% to 10% of the public welfare benefit that derives from allocating spectrum to its highest and best use. If so, Adoption of the NPSTC Proposal would result in a public welfare loss of \$8 billion to \$16 billion in comparison to the Pegasus Proposal.

We believe that there are alternatives to the NPSTC Proposal that enable achievement of the objectives set forth in the Commission's December 2005 Report to Congress which are significantly more efficient in spectrum usage. In particular, we believe that there are two that deserve primary consideration in this proceeding:

- The Joint Commenters' Proposal; and
- The Pegasus Proposal.

The Joint Commenters' Proposal and the Pegasus Proposal share an important common element. They would both preserve the existing allocation of 12 MHz of Public Safety spectrum to narrowband, but concentrate it into a 2 x 6 MHz allocation, rather than the 4 x 3 MHz allocation provided for currently that is maintained in the NPSTC Proposal. This simple step results in two important benefits:

- It reduces the number of boundaries between narrowband and broadband requiring interference protection from eight to four; and

- It ensures that Public safety broadband will be contiguous to commercial broadband at at least one boundary.

The first of the two benefits identified above results in a 50% or greater increase in the spectrum available for Public Safety broadband within the existing Public Safety allocation. The second step is a prerequisite to enabling Public Safety/commercial “mixed use” networks.

The Joint Commenters’ Proposal and the Pegasus Proposal differ in the following respects:

- *Placement of the 2 x 6 MHz Public Safety narrowband allocation:* The Pegasus Proposal would place Public Safety narrowband between 764 - 770 MHz and between 794 - 800 MHz. By contrast, the Joint Commenters’ Proposal would place Public Safety narrowband between 770 - 776 MHz and between 800 - 806 MHz.
- *Guard Band Requirements:* The Pegasus Proposal proposes that interference protection for Public Safety narrowband be provided by reference to specific Power Flux Density (“PFD”) and Out Of Band Emission (“OOBE”) limits imposed upon abutting spectrum, rather than by use of mandated guard bands of a fixed size. The Joint Commenters’ Proposal provisionally adopts the requirement of a 1 MHz guard band at the boundaries between Public Safety narrowband and commercial or Public Safety broadband set forth in the NPSTC Proposal.
- *Re-Allocation of the Upper 700 MHz B band:* The Joint Commenters’ Proposal proposes that the Upper 700 MHz B band (most of which was turned back to the Commission by Nextel in the 800 MHz Report & Order) be re-allocated as part of this proceeding, ceding 3 MHz of the B band to Public Safety and the remaining 1 MHz to existing A band licensees. The Pegasus Proposal does not require that the Commission address the B band in this proceeding.

- *Movement of the Upper 700 MHz A band:* The Joint Commenters' Proposal proposes that the Upper 700 MHz A band be moved from 746 – 747 MHz and 776 – 777 MHz to 761 – 762.5 MHz and 791 – 792.5 MHz (also giving effect to augmenting the A band by 1 MHz from re-allocation of the B band). The Pegasus Proposal does not require that the Commission address the A band in this proceeding.

In sum, the Joint Commenters' Proposal and the Pegasus Proposal differ primarily in the scope of what is proposed be changed in this proceeding. The Joint Commenters' Proposal requires that the Commission approach this proceeding more comprehensively to include matters affecting the Upper 700 MHz generally, including specific steps in regards to the A and B bands. The Pegasus Proposal outlines two steps that can be adopted by the Commission in a proceeding limited narrowly to consideration of the Upper 700 MHz spectrum allocated to Public Safety.

We believe that the public interest would be well served if this proceeding were broadened to a consideration of the entire Upper 700 Mhz, as we do not believe that the objectives set forth in the Commission's December 2005 Report to Congress can be fully accomplished in a proceeding narrowly addressed to the Upper 700 MHz Public Safety allocation. In the event that the Commission does so, we fully support the Joint Commenters' Proposal, because we believe that the Joint Commenters' Proposal efficiently accomplishes the objectives set forth in the Commission's December 2005 Report to Congress.

However, if the Commission has inalterably determined to limit this proceeding to a narrow consideration of the Upper 700 MHz Public Safety allocation, we believe that the two changes outlined in the Pegasus Proposal will efficiently accomplish many of the goals set forth in the Commission's December 2005 Report to Congress.

By contrast, we believe that the NPSTC Proposal does not accomplish those goals, and worse, may actually prevent their accomplishment.

DEPLOYMENT OF PUBLIC SAFETY SYSTEMS IN THE UPPER 700 MHZ BAND IS NOT EXTENSIVE AND SHOULD NOT PRECLUDE CONSIDERATION OF PROPOSALS TO REALLOCATE PUBLIC SAFETY NARROWBAND FROM THE CURRENT 4 X 3 MHZ ALLOCATION TO THE MORE EFFICIENT 2 X 6 MHZ ALLOCATION PROPOSED IN BOTH THE JOINT COMMENTERS' PROPOSAL AND THE PEGASUS PROPOSAL.

A key feature of the NPSTC Proposal is that it requires maintaining the position of the narrowband channels where they currently are. The NPSTC Proposal letter dated February 6, 2006 does not illuminate why NPSTC members continue “to be strongly opposed to any change of the current Narrowband voice configuration” apart from stating:

“That significant investment has already been committed to planning how these narrowband voice channels will be used and that agencies have procured equipment to use these channels which manufacturers have commenced fulfilling reflects the importance to maintain the number of narrowband channels and their location. NPSTC’s review has been conducted within this context.”

The extent and nature of neither the investment in planning, nor the procurement, nor the actual manufacturing of equipment is nowhere quantified. While we respect the value of settled expectations, we believe that the Commission should insist on developing a clear record of the extent to which actual investment in the current positioning of the narrowband channels has occurred, and what costs would be entailed in moving the channels. We submit that it is not enough, in a context in which Public Safety is seeking flexibility with respect to the use of its

own spectrum, for Public Safety simply to say that it is more convenient not to change any other aspect of the band plan, besides the aspect that Public Safety would like to see changed. If there is a substantial investment in the placement of the narrowband channels, Public Safety should be able to and required to demonstrate that investment so that the Commission can make a reasoned decision in the public interest, weighing all the relevant costs and benefits.

As detailed below, our research indicates that there are few systems actually deployed in the Public Safety narrowband channels, and that the equipment being used there is functionally very close to equipment produced for the 800 MHz Public Safety bands. In fact, two of the manufacturers sell equipment that is dual 700/800 MHz. Our research indicates that it should be a straightforward modification, with potentially most of the changes in software, to move the narrowband channels.

Specifically, as of May, 2006 only 26 towers have been reported to be up and running in four locations. The locations are in New Orleans, Louisiana; Las Vegas, Nevada; west central Tennessee; Kansas City, Missouri; and northern Idaho. The FCC recites in this NPRM that it has approved only 4 of 55 Regional Planning Committee Proposals for building out the 700 MHz spectrum. We understand that the administrative investment of time is significant, but that must not by itself be a reason to adhere to a legacy decision that no longer optimizes the spectrum in light of technological developments. Indeed, a group comprised of Regional Planning Committee Chairs and other Public Safety officials involved in implementing the 700 MHz band plan have attested that attractiveness of rebanding now to maximize opportunities for robust Public Safety broadband outweighs considerations involving the investment in Public Safety narrowband deployment to date

Such technological developments, with the appropriate selection of the location and permitted usage of the bands can enable even more intensive use of the spectrum. Due to the limited deployment of Public Safety systems within the Upper 700 MHz band, those technologies could be employed with minimal *national* impact.

We also understand that equipment manufacturers require certainty in order to plan and produce equipment for the narrowband allocation. Although we do not have access to the manufacturer's designs, both the upper 700 MHz and 800 MHz Public Safety deployments are P25 compliant systems. P25-compliant systems are radios can communicate in analog mode with legacy radios and in either digital or analog mode with other P25 radios and are supported by many of the Public Safety organizations as the standard for next generation Public Safety communications systems. It is our understanding that P25 radios that has been designed for the 800 MHz bands could be easily modified to operate in the upper 700 MHz band. The changes would include straightforward modifications only at the front-end radio frequency portions of the radio³. Therefore moving the narrowband portions of the Public Safety bands should not require a new detailed design or a major development program. This should not pose any engineering challenges. It also should be a reasonable expectation that the cost and deployment schedule impact for such modifications would be minimal.

CURRENT TECHNOLOGY PROVIDES A VARIETY OF MEANS FOR MITIGATING HARMFUL INTERFERENCE. MANDATING THE USE OF GUARD BANDS IS THEREFORE INFLEXIBLE AND CONTRARY TO PRINCIPLES OF EFFICIENT SPECTRUM MANAGEMENT

³ This would include the use of different pre-select filters and potentially new settings (potentially under software control) for the voltage-controlled oscillators (VCO) that are used to convert to an intermediate frequency (IF).

NPSTC (as well as Motorola and Lucent) propose the adoption of guard bands internal to the Public Safety spectrum as the sole means to protection of Public Safety narrowband from harmful interference from abutting broadband communications. We note that the NPSTC letter dated February 6, 2006 offers virtually no citation, support or explanation for this conclusion other than the following statement: “Our analysis determined it important to maintain a .975 MHz guard band channel between broadband and other operations.”

Technology has developed considerably since the original *First R&O* in 2000 when the Commission established the A and B Blocks as guard bands, and today provides engineers with a variety of means for protecting Public Safety narrowband communications from undue interference not available in 2000. As a result, it is now feasible for the Commission to adopt rules that will protect Public Safety narrowband communications while also allowing licensees of abutting spectrum the flexibility to choose the most efficient means to assuring interference protection rather than mandating guard bands of a fixed width.

In our White Paper, and the subsequently filed supplement to it, we outlined, based on the engineering work of Dale Hatfield, Stagg Newman and Charles Ellis, the various ways in which harmful interference between commercial broadband operations and Public Safety narrowband operations could be mitigated, other than through the use of guard bands. We submit that that the Hatfield-Newman-Ellis analysis is equally valid with respect to the question of how Public Safety broadband and narrowband operations can be protected from one another.

As explained in the Interference Protection section of the SPTF report, the November 2005 supplemental white paper, and in Appendix B of these comments the primary objective of interference protection is to prevent harmful interference to users of Public Safety narrowband spectrum. Harmful interference is caused by signal energy being allowed into the receiver that is not destined for that receiver. Such protection from undesired signals can be achieved through a multitude of mechanisms such as emission requirement for the transmitter, filtering requirements for the receiver, use of components that reduce the effects of the undesired PFD, limits on PFD that can exploit both architectural and antenna techniques, and the use of guard bands.

We believe that the Commission should require a careful consideration in this proceeding of *all* means to avoiding harmful interference to Public safety narrowband communications. The Commission should at all costs avoid findings that may be construed to validate the superiority of guard bands for interference mitigation purposes without any record supporting such findings. If this were to occur, there is a very real danger that this will be argued as precedent to deny proposals that we and others have put forward regarding the A and B Blocks, which the Commission has promised to take up. Specifically, we ask that the Commission expressly state, if it accepts the NPSTC Proposal, that the guard bands thus established are established in accommodation of Public Safety's preferred use of its own spectrum, and have no prejudicial or precedential effect on the question of the necessity of guard bands outside the Public Safety allocation

CONCLUSION

We urge the Commission in the strongest terms *not* to adopt the NPSTC proposal. The NPSTC Proposal will not achieve the objectives set forth in the Commission's December 2005 Report to Congress:

- It is wasteful of both Public Safety spectrum and of commercial spectrum in the Upper 700 MHz;
- It does not allow channel widths sufficient for 4G broadband technologies;
- It prevents potential development of Public Safety/commercial "mixed use" networks;
- As is set forth in Appendix B to these comments, its adoption will impose significant direct and indirect costs on Public Safety.

For these reasons, as well as others set forth above and in Appendices A and B to these comments, as well as in the Joint Commenters' comments filed separately, the NPSTC Proposal, as well as the Motorola and Lucent proposals, are clearly inferior to the Joint Commenters' Proposal and the Pegasus Proposal.

Instead, we urge the Commission to broaden the frame of the instant proceeding and give due consideration to adopting the Joint Commenters' Proposal, which we fully support. In the event that the Commission is disinclined to consider broadening this proceeding sufficiently to give full consideration to the Joint Commenters' Proposal, we then urge the adoption of the Pegasus Proposal. The Pegasus Proposal efficiently remedies the defects of the NPSTC Proposal, does so via steps that can be taken within the narrow confines of this proceeding and will not prejudice future proceedings concerning the A and B Blocks that the Commission has promised to take up separately.

Respectfully submitted,

//signed//

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