

In the Matter of)
)
Technological Advisory Council Spectrum) ET Docket No. 17-340
Policy Recommendations)

To: Chief, Office of Engineering and Technology

**COMMENTS
OF
PDVWIRELESS, INC.**

pdvWireless, Inc. (“PDV” or “Company”) respectfully submits its Comments in response to the Office of Engineering and Technology (“OET”) Public Notice seeking comment on spectrum policy recommendations of the Federal Communications Commission (“FCC” or “Commission”) Technological Advisory Council (“TAC”).¹ These recommendations provide thoughtful, constructive input regarding the FCC’s increasingly challenging task of achieving an “efficient and fair allocation of spectrum in congested RF environments.”² PDV agrees with the TAC that the Commission should begin the process of implementing spectrum management principles that reflect the TAC recommendations as promptly as possible. The TAC is also correct that specific risk-informed interference assessment and statistical service rules, if adopted by the FCC, will need to be integrated into its allocation processes over time.

¹ Office of Engineering and Technology Seeks Comment on Technological Advisory Council Spectrum Policy Recommendations, *Public Notice*, ET Docket No. 17-340, 32 FCC Rcd 10160 (2017) (“Public Notice”).

² *Id.* at 1.

I. TAC POLICY RECOMMENDATIONS

The TAC recommendations are organized into three categories of spectrum management principles: Interference Realities, Responsibilities of Radio Services, and Regulatory Requirements and Actions.³ As explained in the Public Notice, they draw in large part on a number of TAC policy papers developed between 2014-2016.⁴ The overarching theme of those papers is a recognition that in an environment of unslacking demand for wireless capacity, the Commission will need to ensure that the spectrum ecosystem – FCC rules, system designs, operating standards, and user expectations – are aligned to maximize the use of this valuable and limited national resource. The first two categories of principles are directed toward the activities of licensees/users, while the third focuses on possible FCC actions.

The principles recommended by the TAC are commendable for their simplicity and commonsense approach to spectrum management. In summary, they state the following:

- 1) Interference Realities – No system is guaranteed an entirely interference-free environment, and the FCC rules cannot be based on protection against exceptional events.

³ *Id.* at 2-3.

⁴ See, December 2015 paper “Basic Principles for Assessing Compatibility of New Spectrum Allocations,” <https://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting121015/Principles-White-Paper-Release-1.1.pdf> (Basic Spectrum Principles White Paper); and March 2014 paper, “Interference Limits Policy and Harm Claim Thresholds: An Introduction,” <http://transition.fcc.gov/oet/tac/tacdocs/reports/TACInterferenceLimitsIntroV1.0.pdf>; see especially *Section 5, Developing harm claim threshold values*; See also, April 2015 paper, “A Quick Introduction to Risk-Informed Interference Assessment,” <http://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting41115/Intro-to-RIA-v100.pdf>; see especially *Section 5, Recommended FCC Action*; and December 2015 TAC paper, “A Case Study of Risk-Informed Interference Assessment: MetSat/LTE Co-existence in 1695–1710 MHz,” <https://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting121015/MetSat-LTE-v100-TAC-risk-assessment.pdf>; see especially *Section 8, Conclusions and recommendations*, and the *Executive Summary*; See also, March 2016 paper, “A Study to Develop the Next Generation Systems Architecture for Radio Spectrum Interference Resolution,” <https://transition.fcc.gov/oet/tac/tacdocs/reports/2016/A-Study-to-Develop-a-Next-Generation-System-Architecture-V1.0.pdf> (Next Generation Architecture for Interference Resolution); June 2014 paper, “Introduction to Interference Resolution, Enforcement and Radio Noise,” see especially *Section V, Potential New Strategies or Approaches for Addressing Enforcement Challenge*.

Licensees/users should anticipate some amount of non-harmful interference and should design their systems to prevent causing and receiving harmful interference.

2) Responsibilities of Radio Services – Transmitters and receivers each have a role in mitigating harmful interference. While the technical parameters of transmitters are defined in the FCC rules, systems should be designed to mitigate the effect of harmful interference through techniques such as co-location, power control, and retransmission protocols.

3) Regulatory Requirements and Actions – This ambitious policy would have the FCC undertake quantitative analyses of inter-service interactions as part of its allocation decisions and its determinations regarding appropriate levels of interference protection. These analyses would require a disclosure of system characteristics and standards, which are not always readily available to the FCC. The TAC also proposes adoption of “interference limits” that would quantify the rights of services to protection from harmful interference.

Additionally, the Public Notice requests comment on the TAC position that reliance on “risk-informed interference assessment and statistical service rules” when considering a change in its rules would better enable the Commission to balance the interests of incumbents who want their operations to continue undisturbed, proponents of change who wish to introduce innovative technologies and/or services, and the public that wants to enjoy the benefits of both existing and new services and to see that this public resource is managed effectively. The TAC also recommends that the FCC adopt steps that will improve resolution of interference situations. Among the actions proposed are the use of automated tools such as a database of prior enforcement activities to give the public notice of how such matters have been handled in the

past, information that could guide their actions in addressing similar situations and possibly reduce the number and the contentiousness of those situations.

II. COMMENTS

The Commission has a commendable, decades-long record of adopting sound spectrum allocation decisions. It has sorted through the oftentimes contentious claims of interested parties, conducted its own technical assessments, and considered the public interest implications in numerous allocation proceedings. Whether it is deciding which among competing offerings are best-suited to be deployed in vacant spectrum or considering whether already allocated spectrum could be modernized to support more technically advanced services, it must take proponent, incumbent, and public interests into consideration. One essential aspect of this decision-making process is an assessment of the potential impact of the proposed service on the operation of other systems; specifically, whether it is likely to cause “harmful interference,” a term defined by the FCC as “[a]ny emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communications service.”⁵

As stated in the TAC Basic Spectrum Principles White Paper,¹ the spectrum environment is becoming ever more crowded, and services increasingly are being assigned in close proximity to one another or even required to share spectrum in certain instances subject to appropriate protocols. In this congested environment, the TAC principles are premised on its belief that, “Realization of certain facts of communications technology will temper the expectation of the incumbent services using spectrum resources as well as the new services that are trying to gain entry into the spectrum.”⁶ Spectrum users and the public generally will be well-served if there

⁵ 47 C.F.R. § 2.1.

⁶ Basic Spectrum Principles White Paper at 3.

are realistic, commonly accepted understandings about the responsibilities of all parties to implement systems that can function effectively in today's wireless world:

The FCC does not provide a brick wall to separate services. Rather, the services are responsible to take whatever steps required to ensure that energy outside their channels does not become harmful interference to them and that they minimize the energy they transmit outside of their channels.⁷

As stated in the Public Notice, adoption of "Interference Limits" to quantify interference protection rights are one way to define the rules-of-the-road without mandating receiver performance specifications. These quantitative descriptions define when a harmful interference claim can be made and have proved effective, for example, at 800 MHz when public safety and cellular systems operate in proximity.⁸ They provide clear guidance for all parties and thereby might even limit the number of interference cases that require resolution by the FCC.

Further, the TAC emphasizes that the wireless environment is not static:

...conditions of interference today are unlikely to be the same as they will be in the future. There are many services that currently operate with no services assigned to adjacent frequency channels. If these systems are designed to operate under those conditions they may not work properly when other services are assigned to the adjacent channels in the future. It is important to design systems to operate effectively as if other systems occupied the adjacent channels.⁹

As with other limited resources, these cautions are intended to encourage parties to exercise responsible stewardship of their spectrum through network design and use of equipment that do not unreasonably foreclose future uses of new co-channel and adjacent band services.

Importantly, the TAC also recognizes that different services serve different needs and thus have varying tolerances for harmful interference. These distinctions are based both on the criticality of the message being delivered and on the method by which it is delivered. It notes

⁷ *Id.* at 13-14.

⁸ *See* 47 C.F.R. § 90.672; *see also* 47 C.F.R. § 27.64(d)(2) for WCS/SDARS interference limits.

⁹ *Id.* at 9.

that “a public safety message generally needs to be accurately understood without appreciable delay. In contrast the typical data transfer can tolerate delays and the typical video feed can tolerate small inaccuracies.”¹⁰ These distinctions are well understood by the Commission and undoubtedly are and will continue to be considered in its spectrum allocation decisions.

The TAC principles also are intended to provide the FCC with tools to best assess the appropriate balance among competing interests. The paper entitled, “A Quick Introduction to Risk-Informed Interference Assessment” highlights the reality that incumbents, understandably, focus on the worst-case scenarios that might arise, but not on their likelihood. The TAC recommends supplementing that information with what it calls risk-informed decision-making, which it describes as “an approach to regulatory decision-making in which insights from quantitative risk assessment are considered along with the public interest, economic analysis and other engineering insights” and, in its opinion, “will lead to more productive use of spectrum assets.”¹¹ The Public Notice notes that this approach has been implemented successfully by the Nuclear Regulatory Commission, a promising precedent, particularly in instances when the operations of critical communications systems are involved.

III. CONCLUSION

All signs indicate that the explosion in wireless communications is still in its initial stages. The compelling need for capacity, in particular broadband capacity, is growing exponentially. Technology has opened up spectrum frontiers that would have been unthinkable even a decade ago, but the immutable laws of physics remain in place. The FCC and the parties that currently or in the future will use this precious resource would be well-served by adoption of the principles recommended by the TAC. If we hope to ensure that spectrum use continues

¹⁰ *Id.* at 7.

¹¹ A Quick Introduction to Risk-Informed Interference Assessment at 2.

to evolve as new technologies and systems are developed and that it is put to its highest and best use, the FCC rules and the systems deployed pursuant to them must allow for maximum use of the nation's spectrum.

Respectfully submitted,

PDVWIRELESS, INC.



John C. Pescatore
President and Chief Executive Officer
3 Garret Mountain Plaza, Suite 401
Woodland Park, NJ 07424
(973) 771-0300
jpescatore@pdvwireless.com

January 31, 2018