

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Review of the Commission's Rules Governing)	WT Docket No. 17-200
the 896-901/935-940 MHz Band)	
)	

COMMENTS OF THE CRITICAL INFRASTRUCTURE COALITION

Alliant Energy
Duke Energy Corporation
Edison Electric Institute
Exelon Corporation and Subsidiaries
PECO Energy Company and
Commonwealth Edison Company
Harris Corporation
Lower Colorado River Authority
National Association of Water Companies
NextEra Energy, Inc.
Sensus USA, Inc.

October 2, 2017

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COMMENTS OF THE CRITICAL INFRASTRUCTURE COALITION

The Critical Infrastructure Coalition submits these comments in response to the Commission's Notice of Inquiry ("*NOI*") in the above-referenced proceeding.¹

I. INTRODUCTION AND SUMMARY

The Critical Infrastructure Coalition ("*CIC*" or "*Coalition*")² consists of a broad range of electric utilities, water authorities, trade associations, and equipment manufacturers that use spectrum in the 896-901/935-940 MHz ("*900 MHz*") and adjacent bands for critical public safety, nuclear power plant security, utility service restoration and maintenance, smart grid applications, and emergency communications. The Coalition appreciates that the Commission is taking a fresh look to ensure that the 900 MHz framework serves the public interest. However, it is imperative that the Commission refrain from adopting changes to the 900 MHz band that would disrupt critical infrastructure communications in the band or in adjacent spectrum.

Several proposals in the *NOI* would threaten critical communications services and should not be pursued. Specifically, realigning the 900 MHz band would disrupt critical

¹ *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, Notice of Inquiry, 32 FCC Rcd 6421 (2017) ("*NOI*").

² The Coalition members are listed on the cover page. These comments represent the general consensus positions of the Coalition, but an individual member of the Coalition also may file its own comments.

communications during any migration period. And forcing narrowband users into a compressed segment of the band adjacent to broadband users would increase the noise floor and result in increased operating costs to maintain the same level of service and coverage. Additionally, placing broadband operations in the 900 MHz band directly adjacent to narrowband operations in the compressed 900 MHz narrowband segment and the 901-902/940-941 MHz narrowband Personal Communications Service (“NPCS”) band would result in harmful interference to critical communications in both adjacent bands. Those interference concerns will be present whether the Commission pursues realignment of the band as originally proposed in the Enterprise Wireless Association and Pacific DataVision, Inc. Petition (“PDV Proposal”),³ through voluntary realignment on a market-by-market basis, or by granting increased operational flexibility that would allow broadband operations in the 900 MHz band.

Meanwhile, the benefits of permitting broadband operations in the band would be low. Because no one questions that retaining a home for incumbent narrowband users is important, any resulting broadband segment would be required to be relatively small, particularly after accounting for a proper guard band required to protect adjacent users. And to the extent the broadband licensee would be required to provide priority service to critical infrastructure providers, other commercial options are already available, such that no unique public benefits would be introduced. The costs of realigning the 900 MHz band or otherwise introducing broadband operations, as outlined above, would outweigh the limited benefits.

Therefore, the Commission should retain the existing framework for the 900 MHz band to ensure that spectrum in and adjacent to the band remains available and reliable for critical infrastructure communications.

³ Petition of the Enterprise Wireless Alliance and Pacific DataVision, Inc. for Rulemaking, RM-11738 (filed Nov. 17, 2014).

As the Commission reviews the record here, it should incorporate the existing robust record opposing the PDV proposal to reconfigure the 900 MHz band.⁴ While the Commission appropriately denied the PDV proposal and initiated a new docket,⁵ the concerns raised in response to PDV's proposal are relevant to many of the proposals in the *NOI* and should be considered here.

II. INCUMBENT USE OF THE 900 MHZ AND ADJACENT BANDS SERVES THE PUBLIC INTEREST

A. Incumbent Users in the 900 MHz Band and Adjacent Bands Rely on the Spectrum for Critical Communications

Critical Infrastructure Coalition members use 900 MHz spectrum and adjacent bands for a wide range of mission-essential communications, including disaster recovery efforts, electrical and water service maintenance and restoration, nuclear power plant operations and security, public safety, and smart grid applications. The examples are bountiful:

NextEra Energy and its subsidiary Florida Power & Light Company use a 900 MHz Private Land Mobile Radio ("PLMR") for power plant security operations, including voice communications required by Nuclear Regulatory Commission regulations;⁶ nuclear siren system operations for public alerts; electrical service restoration and maintenance, including emergency notifications and disaster recovery communications; smart grid energy efficiency monitoring; and electric distribution system controls. For its recovery efforts following Hurricane Irma, Florida Power & Light ("FPL") relied on its 900 MHz two-way PLMR system to help restore power to more than 4.4 million electrical customers in 10 days. In many cases, this communications was the only available system for field restoration crews to utilize.

⁴ See FCC Docket RM-11738.

⁵ *NOI*, 32 FCC Rcd at 6435 ¶ 49.

⁶ 10 C.F.R. § 73.55.

The Lower Colorado River Authority⁷ (“LCRA”) uses 900 MHz spectrum throughout central Texas for emergency voice communications and daily utility operations, including critical two-way voice and data services. In addition, LCRA engages in non-profit shared use of its 900 MHz land mobile radio system with other utility generation, transmission and distribution companies, and public safety entities, such as police, fire, EMS, emergency management, school districts, transit authorities, and flood management and warning systems.⁸

Recently, LCRA has been utilizing its B/ILT licensed spectrum to monitor river conditions and manage flooding related to Hurricane Harvey. LCRA also activated its 900 MHz Emergency Communications Unit to support public safety operations and restoration efforts in Rockport and Port Aransas, TX and to survey damage along LCRA transmission lines between Corpus Christi and Rockport, TX. The LCRA system remained operational throughout Hurricane Harvey, while commercial networks experienced outages.⁹ LCRA has invested in generators, hardened shelters, and redundant communication links to keep its critical 900 MHz systems operating in the most challenging circumstances. Many real time decisions were made utilizing data captured via B/ILT channels, and any interference or loss of service regardless of

⁷ The LCRA is a Texas conservation and reclamation district that provides many vital services, including delivering electricity, managing the water supply and environment of the lower Colorado River basin, providing public recreation areas, and supporting community development. LCRA supplies wholesale electricity to 34 Texas retail utilities that serve more than 1 million people in 55 counties. LCRA is a steward of the Colorado River and provides water for more than one million people, businesses, and industries in the lower Colorado River basin in Texas. LCRA operates six dams on the Colorado River that create the Highland Lakes and, through these dams, manages floodwater, and produces hydroelectric power. LCRA manages over 30 parks, recreation areas, and natural resource areas. LCRA’s affiliate, LCRA Transmission Services Corporation, owns or operates about 5,200 miles of transmission lines and owns, operates, or provides services at nearly 400 substations.

⁸ LCRA engages in non-profit, shared use of the spectrum pursuant to 47 C.F.R. § 90.179.

⁹ See, e.g., Federal Communications Commission, *Communications Status Report for Areas Impacted by Hurricane Harvey* (Aug. 26, 2017), https://apps.fcc.gov/edocs_public/attachmatch/DOC-346368A1.pdf.

duration would leave those managing these situations blind to current conditions. LCRA's experience with its 900 MHz system during Hurricane Harvey is consistent with many other coalition members' experiences during Hurricane Matthew in 2016, as detailed in the Coalition's letter to the Commission in the PDV following that storm.¹⁰

Members of the National Association of Water Companies, which represents companies that help provide essential water and wastewater services to nearly 73 million people in the United States,¹¹ rely on 900 MHz data transmissions to make real time operational changes and to obtain situational awareness regarding system operations, water quality, flows, and volumes to ensure public health and safety. Given the interoperable nature of the radio frequency, it is a common tool for community water systems to use to communicate with remote public drinking water facilities and emergency responder facilities that provide fire protection.

Sensus¹² uses an innovative and distinctive network communications technology called FlexNet that operates in licensed narrowband PCS spectrum adjacent to the 900 MHz band to provide utility customers with secure and reliable connectivity solutions that support multiple applications, including advanced metering infrastructure ("AMI"), distribution automation and monitoring, demand response, and equipment monitoring and control, among others.¹³ The Sensus FlexNet radio system allows users to operate in near real time to: read end user meters and report on usage or trouble at the end point residence or business; send alerts of outages,

¹⁰ Letter from Tania Hanna, Vice President, Government Relations, Harris Corporation *et al.*, Critical Infrastructure Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission, RM-11738 (filed Dec. 8, 2016).

¹¹ National Association of Water Companies, About NAWC, <http://www.nawc.org/about-NAWC/> (last visited Sept. 28, 2017).

¹² Sensus USA Inc., through its subsidiary Sensus Spectrum LLC, holds nationwide narrowband PCS licenses whose channels start at 901/940 MHz and that are immediately adjacent to the 900 MHz band at issue. *See* Comments of Sensus USA Inc., RM-11738 (filed Jan. 12, 2015).

¹³ *Id.*

surges, imbalances, or other emergencies occurring in a utility's network, including detection of leaks for water utilities; and enable end users to manage electrical, natural gas, or water usage. Sensus's FlexNet technology has been used to, among other things, accelerate critical disaster response efforts.¹⁴

For example, as a Sensus FlexNet customer, PECO Energy Company, headquartered in Philadelphia, uses spectrum in the 900 MHz range for several mission critical applications, including advanced meter reading, outage management, and distribution automation. These applications directly monitor and control approximately 2.3 million electric and gas meters, and over 500 distribution automation devices such as pole top switches, capacitor controllers, and remote monitors.

Alliant Energy¹⁵ uses spectrum in the 900 MHz range for several mission critical applications, including two-way land mobile radio communications used to communicate with and between field operations, maintenance and construction crews, and personnel. Alliant also relies on 900 MHz spectrum for distribution automation devices that are remotely monitored and controlled to optimize performance of its electric distribution systems. Alliant uses AMI in the adjacent narrowband licensed spectrum for two-way communications to over 640,000 gas and electric smart metering devices currently, and plans to add another 720,000 devices to the AMI system over the next two years. These AMI electric smart meters provide enhanced efficiencies and rate options to customers, as well as providing timely power outage information needed to support effective restoration activities.

¹⁴ See, e.g., Derl Rhoades, *AMI Extends Alabama Power's Outage System Effectiveness in Historic Storm*, Electric Energy T&D Magazine (January/February 2012), http://www.electricenergyonline.com/show_article.php?mag=&article=615.

¹⁵ Alliant Energy Corporation, headquartered in Madison, Wisconsin, provides regulated electric and natural gas service to 960,000 electric and 410,000 natural gas customers across Iowa and Wisconsin.

B. The Incumbent Uses Have a Positive Impact on the Economy

The ability of incumbent licensees in the 900 MHz band and adjacent spectrum to rely on their spectrum holdings provides a positive impact on the United States economy. For licensees that use 900 MHz spectrum for voice dispatch services, use of the spectrum allows for more efficient and secure maintenance and restoration of the electric grid. This is true for routine maintenance, but is also quantifiable in the context of service restoration following disasters. For example, Florida Power & Light Company estimates that, following a disaster roughly the magnitude of a category 4 hurricane, use of 900 MHz PLMR radios for dispatch and emergency communications saves the company 1 to 2 days in total restoration time, compared to estimated restoration without the use of 900 MHz communications.¹⁶ Given that FPL estimates the daily cost to the company for electric service restoration following a major storm at roughly \$40 to \$50 million, use of the 900 MHz network directly saves the company between \$40 and \$100 million during each major recovery effort. The savings in service restoration time also has a positive economic impact on the entire affected service territory, as service restoration allows for the delivery of public services, enables businesses within the territory to reopen their doors and stem further economic losses while helping to maintain public safety and stability.

Smart meters operating in adjacent NPCS spectrum also have a positive impact on the economy. The benefits of Smart Grid operations include increased reliability, efficiency, and security and reduced electricity prices and better safety. Sensus's NPCS FlexNet users have roughly 15 million endpoints and thousands of base stations, which represent an investment by FlexNet customers of well in excess of \$1 billion in equipment. In addition, Sensus has invested hundreds of millions of dollars in ongoing system and equipment design and improvements.

¹⁶ These estimates were developed based on FPL's historical experience with disaster recovery efforts and do not attempt to quantify the impact of Hurricane Irma.

C. Users and vendors are continuing to develop narrowband innovations within the existing 900 MHz framework

Users in the 900 MHz and adjacent bands are continuing to develop narrowband innovations within the existing framework. Over the past twelve years, Sensus has expanded the capability of its system to move beyond monthly reads of end meters and to encompass sophisticated monitoring and control services to utility customers, including distribution automation, outage prevention and reporting, voltage conservation and reduction, street lighting control and monitoring, leak detection and reporting, gas pipeline corrosion monitoring, and data analytics. Sensus has continually improved its system design to more efficiently use the available bandwidth, significantly improve the data rates, and enhance messaging capability. Sensus has been consistently recognized in the industry as a leading innovator in the Advanced Metering Infrastructure and Smart Grid markets.

The Harris Corporation is investing millions of dollars into developing new products for the 900 MHz band, which includes new Base Stations and terminal devices that follow the P25 and DMR standards. These products will provide improved spectral efficiency, greater coverage, enhanced interoperability with neighboring utility and public safety agencies, as well as integrated broadband capabilities.

Additionally, technological advances in processing data received via B/ILT channels are permitting continued innovation through narrowband communications. LCRA has been collecting and processing thousands of data points in real time to model and project river conditions, including during Hurricane Harvey and its aftermath. Predicting a river crest is of immense importance when one foot of water can be the difference between flooding a home, shelter, or entire community. These developments highlight the importance of preserving and protecting the current uses of the B/ILT band.

III. THE POTENTIAL HARMS OF RECONFIGURING OR PERMITTING BROADBAND OPERATIONS IN THE 900 MHz BAND OUTWEIGH THE LIMITED BENEFITS OF CREATING A SMALL BROADBAND SEGMENT

Introducing broadband operations into the 900 MHz band risks causing harmful interference to incumbent critical communications users both in the band and in adjacent spectrum, would be costly to effectuate, and would result in increased operating costs for incumbent users on an ongoing basis. At the same time, any countervailing public interest benefit would be relatively small. The *NOI* envisions a 3/3 MHz broadband segment, or at most, a 5/5 MHz band. However, those bandwidths do not take into account the guard bands that would be necessary to protect users in adjacent bands, which would further diminish the amount of spectrum available for broadband operations. Further, to the extent the Commission views potential broadband service offerings to critical infrastructure providers in the 900 MHz band as a public interest benefit, a variety of similar offerings have been introduced since PDV first submitted its proposal in 2014. The Commission should decline to move forward with the proposals in the *NOI* that would introduce broadband operations into the 900 MHz band and risk disruption to critical communications in the band.

A. Introducing Broadband Operations into the 900 MHz Band Would Likely Result in Harmful Interference to 900 MHz Incumbents and Adjacent Band Users

Allowing broadband operations in the 900 MHz band, whether through reconfiguring the band or increasing operational flexibility,¹⁷ would cause harmful interference to incumbent mission-critical communications in the band as well as critical communications uses in adjacent spectrum. These concerns would also hold true under a voluntary, market-by-market approach

¹⁷ See *NOI*, 32 FCC Rcd at 6428-32, Sections III.A and III.B.

to rebanding,¹⁸ as broadband operations would be spectrally adjacent to narrowband PCS operations in voluntarily rebanded markets, and would be geographically adjacent to incumbent 900 MHz users on a co-channel basis in markets that do not voluntarily reband.

B/ILT incumbents have historically cooperated to resolve interference among themselves, as interference to their mission-critical communications has been considered unacceptable at any level. In contrast, because B/ILT channels in the 900 MHz band are allocated in 12.5 kHz segments, they are both susceptible to interference from broadband operations and limited in their ability to mitigate such interference. As commenters noted in response to the PDV Proposal, incumbent 900 MHz B/ILT users have previously experienced interference from Commercial Mobile Radio Services (“CMRS”) operations more than 10 MHz away.¹⁹ However, in at least one instance, the adjacent broadband provider recognized the negative impact its transmissions were causing to critical B/ILT communications and redesigned their systems nationwide to prevent continued interference.

The record in the PDV proceeding also demonstrates that broadband operations risk harmful interference to narrowband operations adjacent to the 900 MHz band.²⁰ The evidence in the record establishes that many of the assumptions underlying the PDV proposal were either unrealistic or unsupportable, and that it presented an overly optimistic interference case that has a low probability of occurring in a purely mobile deployment and a nearly zero probability of

¹⁸ See *Id.* at 6432 ¶ 37.

¹⁹ See Letter from William P. Cox, counsel for NextEra Energy, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, RM-11738 (filed Dec. 23, 2015) (“Dec. 2015 NextEra Letter”).

²⁰ Comments of Sensus USA Inc., RM-11738 (filed June 29, 2015).

occurring with substantial machine-to-machine traffic.²¹ PDV's response failed to demonstrate that these concerns were not technically correct or well founded.²²

B. Relocating 900 MHz Incumbents Would Be Disruptive and May Not Be Feasible in Many Markets

Relocating existing licensees in the 900 MHz band would be disruptive to existing critical communications and may not be feasible in some markets. The Commission's experience with rebanding the 800 MHz band should serve as a cautionary tale. The Commission first adopted its plan to reconfigure the 800 MHz band in 2004.²³ Thirteen years later, the 800 MHz rebanding process is still not complete, even though that process involved a large, established nationwide provider. Reconfiguration would be much riskier since there are no established CMRS providers with the financial ability to provide an extensive remediation if required. Moreover, as depicted in the map of B/ILT sites included in the *NOI*, many of the largest markets are already facing congestion and lack the available spectrum to facilitate a migration.²⁴

Reconfiguring the 900 MHz band also would be costly. In addition to the direct costs of reconfiguring the band on a one-time basis, ongoing operating costs also will increase because if the B/ILT incumbents are compressed into a 2/2 MHz segment of the band, users may be forced to double the number of sites to obtain comparable coverage.²⁵ Each additional site necessary to provide comparable coverage will add increased operational costs associated with tower leases,

²¹ *Id.* at 9, 11-12.

²² See Reply Comments of the Enterprise Wireless Alliance and Pacific DataVision, Inc., RM-11738 (filed July 14, 2015).

²³ See *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969 (2004).

²⁴ *NOI*, 32 FCC Rcd at 6424 ¶ 7.

²⁵ See Dec. 2015 NextEra Letter.

maintenance, and other ongoing operating costs. In order to make incumbents whole, any broadband licensee would need to commit to cover such increased operating costs on an ongoing basis for incumbent narrowband licensees.

C. While Utilities and Other CII Users Urgently Need Access to Broadband Spectrum Below One GHz, the Limited Amount in this Band Would Not Provide Unique Benefits to Critical Infrastructure Providers or the Public

Utilities and other critical infrastructure industry (“CII”) users urgently need access to broadband spectrum below one GHz to develop their own private network systems based on LTE technology. The proposals to reconfigure the 900 MHz band by creating a small 3/3 MHz broadband block adjacent to 900 MHz narrowband users, however, will not satisfy those needs. As discussed above, reallocating the 900 MHz PLMR band to provide this broadband spectrum would be extremely disruptive to the incumbent users, would be very costly, and especially during any transition period would adversely affect the ability of the incumbent users to continue to provide and maintain reliable energy delivery services in a manner that would be safe for their personnel and the American public.

While a traditional size broadband block (5/5 MHz) in spectrum below one GHz is greatly needed by CII users, no unique benefits to utilities will be gained by licensing a small 3/3 MHz broadband option to EWA/PDV. Compared to that option, multiple alternatives are already available in the marketplace. For example, AT&T offers utilities the ability to lease spectrum for 15 years for LTE service using Nokia technology.²⁶ Sprint and Ericsson also offer a similar solution in the 2 GHz band. These offerings from more financially strong entities do

²⁶ Donny Jackson, *AT&T Unveils Plan to Lease Spectrum to Utilities for Private Networks Utilizing Nokia Technology*, Urgent Communications (Feb. 11, 2016), <http://urgentcomm.com/utility/att-unveils-plan-lease-spectrum-utilities-private-networks-utilizing-nokia-technology?page=1>. See also AT&T Newsroom, *AT&T and Nokia Introduce a New 4G LTE Wireless Network Solution for Utilities* (Feb. 9, 2016), http://about.att.com/story/nokia_new_4g_lte_wireless_network_solution.html.

not require disruption to critical communications presently in and adjacent to the 900 MHz band. It is unrealistic to conceive that a start-up 900 MHz broadband provider could match the coverage, pricing, or options of the established carriers.

Utilities, and therefore consumers, also benefit from the ability to fully manage their own networks, including spectrum. LCRA has invested hundreds of millions of dollars over several decades to achieve the reliability levels required for its communications system to withstand a major weather event. For example, during Hurricane Harvey LCRA found its 900 MHz system particularly valuable because it had the ability to monitor and manage its system. In contrast, because LCRA did not have visibility to the inner operations of existing third party carriers, it received no indication of impending third party communications outages that would have allowed LCRA to proactively adjust its resources; and no guarantee of service restoration time for the commercial service was provided. Indeed, there is no guarantee or reasonable expectation that a third party would design or build the system with the reliability LCRA requires across the approximately 50,000 square mile territory LCRA currently serves. And a third party building a system from the ground up would be at a severe disadvantage trying to provide a similar service across the same territory.

IV. LICENSEES THAT HAVE NOT BUILT OUT SHOULD NOT RECEIVE A WINDFALL FROM ANY RECONFIGURATION

To date, the participants of the Critical Infrastructure Coalition have demonstrated a willingness to invest in and to build out their systems and load them as licensed. In many markets, the incumbent CIC users have the need for more spectrum, but it is not available because of companies holding undeveloped spectrum for speculative purposes. For example, PDV holds a substantial amount of spectrum on a national basis that they highlighted at their inception would be developed into dispatch systems and later transitioned to broadband. To

date, PDV has only deployed in limited markets compared with the vast spectrum holdings they have. Florida Power & Light has more users deployed in its 27,000 square mile service territory than PDV has published on their web page and SEC filings nationally. If the FCC were to move forward with some form of a spectrum reallocation, PDV, who has not demonstrated a record of properly constructing licensed systems, should not be rewarded with additional spectrum just because it is the largest spectrum holder in the 900 MHz band.

V. CONCLUSION

For the foregoing reasons, the Commission should not move forward with proposals in the *NOI* that would disrupt critical infrastructure communications in the 900 MHz band and adjacent spectrum.

Respectfully submitted,

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