

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

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

To: The Commission

**REPLY COMMENTS OF NEXTERA ENERGY, INC.**

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NextEra Energy, Inc. ("NextEra")<sup>1</sup> hereby submits its reply comments in the above-captioned proceeding to examine potential rule changes for the 896-901/935-940 MHz band ("900 MHz band").<sup>2</sup>

**I. INTRODUCTION AND SUMMARY**

As discussed in its initial comments, NextEra and its subsidiaries are the holders of numerous Business/Industrial/Land Transportation ("B/ILT") narrowband wireless licenses that are configured to operate across the current 5/5 MHz of spectrum in the 900 MHz band to provide optimal performance. NextEra continues to vigorously oppose the proposals to reconfigure the 900 MHz band for broadband, especially the proposal of the Enterprise Wireless Alliance and PDVWireless, Inc. (collectively "EWA/PDV") to reconfigure the band into a 3/3 MHz broadband segment and 2/2 MHz narrowband segment. NextEra also opposes a broadband reconfiguration through voluntary realignment on a market-by-market basis or by granting increased operational flexibility that would allow broadband operations in the band.

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<sup>1</sup> NextEra is the parent company of Florida Power & Light Company ("FPL"), which serves approximately 4.9 million customer accounts in Florida and is one of the largest electric utilities in the United States.

<sup>2</sup> *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, Notice of Inquiry, 32 FCC Rcd 6421 (2017) ("NOI").

While critical infrastructure industry (“CII”) entities such as FPL need new broadband spectrum for their operations, the small amount of broadband service gained under any of these proposals would not offset the disruption that would be caused by rebanding, the reduction of available channels for future narrowband growth, and the likelihood of interference from the neighboring broadband provider and among the users in the compressed B/ILT segment that use their systems for mission-critical communications.

## **II. HURRICANE IRMA CONFIRMS THE CRITICAL NEED FOR, AND ROBUST EFFECTIVENESS OF, FPL’S NARROWBAND SYSTEM.**

As discussed previously, FPL uses its 900 MHz private land mobile radio (“PLMR”) system for, among other things, dispatch communications associated with electrical service restoration and maintenance including emergency notifications and disaster recovery communications. This capability was essential when Hurricane Irma, the largest hurricane event FPL has ever faced, recently devastated parts of the southeast U.S. The powerful storm affected all 35 counties and 27,000 square miles of FPL’s service territory, causing more than 4.4 million customers to lose power. FPL’s preparation and coordinated response, supported by its robust 900 MHz internal communications system, enabled the company to restore service to over two million customers in one day and to complete the restoration of all 4.4 million customers in ten days. These efforts resulted in the fastest restoration of the largest amount of people by any one utility in U.S. history. The results would not have been possible without the availability of FPL’s hardened 900 MHz band voice dispatch system that was used for 4.5 million transmissions to coordinate restoration operations.<sup>3</sup> While consumer cellular communications were disrupted and then congested for many days after Irma made landfall, 90% of FPL’s critical

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<sup>3</sup>In comparison to Hurricane Wilma, a Category 3 storm in 2005 where the average customer outage lasted for over five days, the average outage for customers affected by Hurricane Irma was roughly two days, a 60% improvement.

dispatch communications capability was available within 12 hours. This is just a recent example of why utilities need hardened communications facilities that are reliable and under the control of the CII operator.

FPL also uses its 900 MHz band systems for other mission-critical communications such as voice communications for nuclear power plant security operations, for nuclear siren system operations for public alerts, as well as for smart grid energy efficiency monitoring and electric distribution system controls. Because such communications affect public safety and the safety of FPL employees and contractors, they need to be operational 24 hours per day, seven days per week.

The claim of EWA/PDV that the 900 MHz band is underutilized should not be accepted at face value. NextEra has first-hand experience that CII demand for the 900 MHz band has been present and is increasing, but could not be fulfilled due to barriers artificially imposed by regulation and spectrum hoarding. Many CII entities that would have considered the 900 MHz band over the past decade were prevented or discouraged from deploying because of the unavailability of unassigned spectrum due to either the FCC freeze on new B/ILT licenses that lasted from 2004 to 2013<sup>4</sup> or the holding of the channels by Sprint and now PDV. The EWA/PDV effort is yet again another artificial barrier to effective CII use of this spectrum.

### **III. MOST CRITICAL INFRASTRUCTURE INDUSTRY ENTITIES CONTINUE TO OPPOSE RECONFIGURATION OF THE 900 MHZ BAND.**

The EWA/PDV proposal for rebanding the 900 MHz band is premised on creating a wireless private carrier, the Private Enterprise Broadband (“PEBB”) carrier, which would provide broadband capabilities to commercial users, particularly CII entities, whose needs are

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<sup>4</sup> See *NOI*, 32 FCC Rcd at 6423 ¶ 5 n.16-17.

not met by existing commercial broadband networks.<sup>5</sup> EWA/PDV claim that the PEBB licensee would build 3/3 MHz broadband networks to suit the specifications of Private Enterprise (“PE”) and CII entities for coverage, reliability and redundancy. Typically, the purported beneficiaries of a new policy support the policy change.<sup>6</sup> In this case, however, most of the purported beneficiaries of the reconfiguration (current 900 MHz band CII licensees) strenuously oppose the proposed reconfiguration.

The Edison Electric Institute, the trade organization that represents all U.S. investor-owned electric companies, said “the technical parameters in the Commission’s proposals for a 2/2 narrowband and 3/3 MHz broadband realignment would result in harmful interference to incumbent operations in the 900 MHz and adjacent bands, and threaten the ultra-high communications reliability electric companies depend on. Additionally, the degradation of electric company Private Land Mobile Radio services would place electrical service workers and the public at a high safety risk and result in life-saving disaster recovery and restoration work being delayed.”<sup>7</sup>

The Utilities Technology Council (“UTC”) said it “opposes expanding commercial use of existing Business and Industrial/Land Transportation channels in the 900 MHz band, because it is concerned that doing so will exacerbate the shortage of available channels for private internal communications and will encourage speculation by commercial entities.”<sup>8</sup> UTC added “that at

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<sup>5</sup> Comments of Enterprise Wireless Alliance and PDVWireless, Inc., WT Docket No. 17-200, at iii, 4 (Oct. 2, 2017) (“EWA/PDV Comments”).

<sup>6</sup> For example, it is common in merger review to seek the opinions of the customers of the merging entities. Their opposition to a merger can be taken as evidence of the harms from the merger.

<sup>7</sup> Comments of the Edison Electric Institute, WT Docket No. 17-200, at 2 (Oct. 2, 2017) (“EEI Comments”).

<sup>8</sup> Comments of the Utilities Technology Council, WT Docket No. 17-200, at i (Oct. 2, 2017).

present, insufficient information exists to demonstrate that a realignment of the band could be accomplished without adversely affecting utility mission critical communications or that broadband networks could be deployed that would provide the same reliability on a cost-effective basis for utility communications.”<sup>9</sup>

Similarly, Duke Energy Corp. explained that it “opposes any realignment of the 900 MHz band because it will threaten the safety and reliability of Duke’s transmission and distribution operations.”<sup>10</sup> Westar Energy, Inc. also opposed the EWA/PDV proposal “because it may result in interference that cannot be mitigated without decreasing the coverage that is essential to Westar’s safe and efficient operation of its electric transmission and distribution operations.”<sup>11</sup> The GridWise Alliance cautioned the FCC against “changes that might have unintended consequences, such as potential negative impacts to critical communications and/or grid safety, security, and reliability.”<sup>12</sup>

The Lower Colorado River Authority noted “its objections to reconfiguring the 900 MHz band to create a broadband service or to amending the rules to permit expanded opportunities for commercial providers to access B/ILT channels.”<sup>13</sup> It further stated that “the 900 MHz B/ILT channels should continue to be reserved for site-based narrowband B/ILT private internal communications and the Commission should not open the band to commercial operations – whether through realignment or through revision of its rules to allow expanded commercial

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<sup>9</sup> *Id.* at 3.

<sup>10</sup> Comments of Duke Energy Corporation, WT Docket No. 17-200, at 1 (Oct. 2, 2017).

<sup>11</sup> Comments of Westar Energy, Inc., WT Docket No. 17-200, at 1 (Oct. 2, 2017).

<sup>12</sup> Comments of the GridWise Alliance, WT Docket No. 17-200, at 1 (Oct. 2, 2017) (filed as Ladeene Freimuth).

<sup>13</sup> Comments of Lower Colorado River Authority, WT Docket No. 17-200, at 7 (Oct. 2, 2017).

operations within the existing band plan.”<sup>14</sup> Exelon Corp. and its subsidiaries PECO Energy Company and Commonwealth Edison Company explained that “allowing such broadband operations and relocating incumbent 900 MHz users would be very costly to accomplish and would result in increased operating costs for incumbent users that would continue on an ongoing basis” and asked the FCC to “retain the existing configuration for the 900 MHz band to ensure that spectrum in the 900 MHz band and spectrum in adjacent bands remain available for critical infrastructure communications.”<sup>15</sup>

The National Association of Manufacturers and MRFAC, Inc., filing jointly, described how the B/ILT allocation in the 900 MHz band “supports mission critical communications systems” and explained that the “preservation of the existing licensing scheme, and the B/ILT frequency pool, is vital to manufacturers in the United States.”<sup>16</sup> The Critical Infrastructure Coalition noted that “realigning the 900 MHz band would disrupt critical 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

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<sup>14</sup> *Id.* at 4.

<sup>15</sup> Comments of Exelon Corporation, WT Docket No. 17-200, at 5, 6 (Oct. 2, 2017) (“Exelon Comments”).

<sup>16</sup> Comments of the National Association of Manufacturers and MRFAC, Inc., WT Docket No. 17-200, at 2, 3 (Oct. 2, 2017).



adjacent bands.”<sup>17</sup> The Ad Hoc Refiners Group explained how the 900 MHz band is the “‘private land mobile band-of-last-resort’ for large mobile radio systems” and strongly endorsed the option that the 900 MHz band “continue to be reserved for site-based B/ILT private internal communications to ensure that spectrum is available to B/ILT entities’ private internal communication needs.”<sup>18</sup>

These comments demonstrate how most entities that EWA/PDV are targeting as potential PE/CII customers not only are uninterested in, but vigorously oppose, repurposing 900 MHz band spectrum for a new broadband segment. While utilities and other CII users need access to broadband spectrum below one GHz to establish their own dedicated broadband networks, this needed bandwidth should not be provided by sacrificing 900 MHz band spectrum already being used for critical narrowband communications.

Additionally, Sensus USA Inc. stated that broadband “operations would pose a risk of harmful interference to incumbent critical infrastructure industry (‘CII’) operations in the adjacent NPCS spectrum, as well as in the 900 MHz band. Proponents of broadband operations at 900 MHz bear the burden of showing that such interference can and will be prevented in all market densities. To date, they have not done so. The Commission must also carefully weigh the costs of destabilizing CII operations against the benefit of creating a relatively small amount of broadband spectrum at 900 MHz.”<sup>19</sup>

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<sup>17</sup> Comments of the Critical Infrastructure Coalition, WT Docket No. 17-200, at 1-2 (Oct. 2, 2017) (“CIC Comments”).

<sup>18</sup> Comments of the Ad Hoc Refiners Group, WT Docket No. 17-200, at 2, 6 (Oct. 2, 2017) (citation omitted).

<sup>19</sup> Comments of Sensus USA Inc., WT Docket No. 17-200, at 2 (Oct. 2, 2017) (“Sensus Comments”).

#### **IV. THE RECORD DOES NOT SUPPORT A FINDING THAT THE BENEFITS OF RECONFIGURING THE 900 MHz BAND OUTWEIGH THE SIGNIFICANT DISADVANTAGES AND COSTS.**

The 900 MHz band is not a case where rebanding is required to resolve ongoing interference problems.<sup>20</sup> Nor is this a case where incumbent licensees can be moved to replacement spectrum that would replicate their existing “noise limited” facilities. And as demonstrated in the previous section, the incumbent licensees—and supposed beneficiaries from rebanding—certainly do not see any potential benefits outweighing the significant costs they will incur.

Instead, this is a case where to benefit a single licensee, PDV, current CII communications links would be squeezed from a 5/5 MHz band into a 2/2 MHz segment in order to create a sliver of broadband spectrum (3/3 MHz) that would hardly be useable or relevant by today’s requirements by the PE/CII customers it is supposed to serve. For example, the broadband utility service restoration apps being offered today are graphical user interface (“GUI”) based and require more bandwidth than a 3/3 MHz segment can provide, especially when a guardband will be required to protect adjacent narrowband users and NPCPS licensees.

Moreover, in comparison to the limited broadband opportunity proposed in the 900 MHz band, more attractive broadband alternatives for utilities are being developed. AT&T and Sprint both offer utilities an option to secure and build out broadband systems under extended agreements. Utilities also likely will be able to utilize the FirstNet system, and Verizon is positioned to offer a service to mission critical users. All of these systems will offer in the range of 5 to 10 megabits of bandwidth to utilities without the disadvantages from reconfiguring the

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<sup>20</sup> 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, 14971-73 ¶¶ 1-3 (2004) (“*800 MHz Report and Order*”).

900 MHz band. The cost of these existing commercial alternatives sets a backstop to the potential value that could be created from an additional, isolated 3/3 MHz segment dedicated to broadband. That is, the potential value the new allocation could create could never be greater than what similar services can be purchased for in the marketplace today.

Before the Commission goes any further in considering whether to reallocate the 900 MHz band for broadband use, it should conduct a preliminary cost-benefit analysis to identify whether it is worthwhile to even consider issuing a Notice of Proposed Rulemaking. A threshold issue is whether all incumbents can be accommodated in the rebanding process. The DVA Consulting report from 2015 that is appended to the EWA/PDV comments indicates that the answer is “no”; eight of the top-25 markets do not have sufficient channels available to relocate incumbents.<sup>21</sup> This includes Miami, which is within FPL’s service area and where the listed shortfall is 113 channels, a shortfall that may be even higher today than it was in 2015. The consultant’s suggested remedies to accommodate displaced narrowband licensees (short-spacing where possible, offering service credit either on the PEBB network or on a different commercial network, or building licensee-specific LTE sites) are simply not acceptable to a CII provider like FPL that requires low latency (under 20 milliseconds) and ultra-high reliability (99.999%) to serve its customers. Hurricanes and tropical storms are an ongoing threat in Florida, and FPL needs a resilient communications network that is hardened and that FPL controls. Without replacement channels adequately spaced and under FPL’s direct control, it is impossible for FPL to replicate its existing capabilities. The shortfall of replacement channels in eight of the top-25 markets should preclude the Commission from going any further in this proceeding.

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<sup>21</sup> Dominick Arcuri, DVA Consulting, LLC, *Analysis of the Proposed Petition for Realignment of the 900 MHz Band under FCC Part 90*, at 6-7 (Dec. 7, 2015) (“DVA Consulting Report”) (attached to EWA/PDV Comments, Attachment 2).

Specifically, FPL has a sizable system with over 65 sites and more than 1000 transmitters operating in the 900 MHz band. About 75% of the spectrum is licensed in the proposed 3/3 MHz portion of the band, and the associated transmitters would require relocation if the PDV proposal is adopted. Needing to move these channels would increase the number of FPL's channels in the lower 2/2 MHz band by nearly 200%, and the odds of finding a suitable channel plan for each FPL transmitter in the 2/2 MHz band are very low. Moreover, developing and implementing the compressed channel plan may require not only moving the NextEra transmitters currently in the proposed 3/3 MHz band but also changing the frequency of some or all of the transmitters currently operating in the proposed 2/2 MHz allocation to facilitate the deployment of a new short spaced channel plan. The compression of this many frequencies in the 2/2 MHz band also will negatively impact antenna system performance and require the costly addition of antenna systems or tower sites.

EWA/PDV also repeatedly claim that the rules in 900 MHz have not kept up with technology changes and that, although incumbents should be protected,<sup>22</sup> the incumbents should also be required to transition their technology to broadband. In fact, the utilities are using the same technologies as public safety in the 800 MHz band, the APCO standards based P25 technology, and the Commission has not required public safety to sunset their dispatch systems because of the technology they use. This clearly is in recognition of the critical nature of their communications.<sup>23</sup> FPL's 900 MHz system, for example, is a highly defined, technically

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<sup>22</sup> See, e.g., EWA/PDV Comments at 3.

<sup>23</sup> This proceeding should confirm that incumbent uses of the 900 MHz band are essential to the operations of critical infrastructure, in light of the input provided by utilities in the NOI and the fact that the Department of Homeland Security recognizes that instability of the Bulk Electric System is a threat to national security. The FCC should consider defining a separate piece of spectrum that can be assigned to utility critical infrastructure operators for continued grid modernization.

advanced architecture with a layered communications stack that provides many innovative business functions. The narrowband architecture also provides an opportunity for innovation and growth. The key limiting factor of this growth is the amount of licensed spectrum that remains undeveloped. While PDV states that it holds 52% of the spectrum in the 900 MHz band, a much smaller percentage of that spectrum is developed with operational systems. As NextEra previously noted,<sup>24</sup> the FCC should adopt rules that will allow it to reclaim spectrum from licensees like PDV that do not utilize their 900 MHz band spectrum, and to make the spectrum available to critical infrastructure users like utilities, pipeline operators, and other similar entities that actually will use this valuable resource.<sup>25</sup>

Moreover, PDV's proposal may be spectrally less efficient than leaving the entire band for narrowband use. It has been demonstrated in other bands that multiple 50 KHz digitally modulated narrowband digital signals, properly deployed, will achieve a larger effective throughput for a geographic area than a wide band signal. Permitting the combination of two or four 12.5 kHz channels to form a 25 or 50 kHz channel may be the most effective digital use of the spectrum, permitting both voice and data services in this band. In fact, many utilities are in the design and early deployment stages of implemented Field Area Networks ("FANs") utilizing 12.5, 25, 50, and in some cases 200 kHz narrowband data radios.

The Commission's preliminary cost-benefit analysis also should account for the value of the current uses. Following a disaster roughly the magnitude of a category 4 hurricane, FPL

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<sup>24</sup> Comments of NextEra Energy, Inc., WT Docket No. 17-200, at 3 (Oct. 2, 2017) ("NextEra Comments").

<sup>25</sup> As NextEra discussed in its initial comments, the Commission should revisit the rules that allow B/ILT licenses to be converted to CMRS use and then lie fallow or underutilized. *Id.* at 6. This conversion process has resulted in SMR licensees like PDV acquiring more spectrum than they utilize and preventing traditional B/ILT licensees from expanding their systems for Smart Grid energy efficiency monitoring and controls for electric distribution systems.

estimates that use of its 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.<sup>26</sup> Given the estimates of the daily cost to the company for electric service restoration following a major storm as 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. Considering the likelihood of such outages in the future combined with potentially similar benefits at other utilities relying on 900 MHz licenses, any potential benefits of rebanding would quickly be offset if these savings were lost. As the total GDP within the FPL service territory averages over \$1 billion per day, the expedited service restoration time has a positive economic impact on the entire affected service territory, allowing for the delivery of public services, enabling businesses within the territory to reopen their doors, and stemming further economic losses while helping to maintain public safety and stability.

Evidence in the record likewise confirms that relocating incumbent users would be time-consuming, costly, and disruptive.<sup>27</sup> For example, the 800 MHz rebanding process first ordered in 2004 has taken much, much longer than anticipated and is still ongoing.<sup>28</sup> NextEra's capital impact alone from a reconfiguration is estimated at approximately \$70 to \$90 million, and the

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<sup>26</sup> See CIC Comments at 7. These estimates were developed based on FPL's historical experience with disaster recovery efforts and do not attempt to quantify the specific impact of Hurricane Irma.

<sup>27</sup> See, e.g., Exelon Comments at 5 ("allowing such broadband operations and relocating incumbent 900 MHz users would be very costly to accomplish"); Sensus Comments at 9-10 ("The Critical Infrastructure Coalition has already warned the Commission that the PDV Proposal understates relocation costs significantly.").

<sup>28</sup> See *800 MHz Report and Order*, 19 FCC Rcd 14969; *Improving Public Safety Communications in the 800 MHz Band*, Supplemental Order and Order on Reconsideration, 19 FCC Rcd 25120 (2004); *Improving Public Safety Communications in the 800 MHz Band*, Memorandum Opinion and Order, 20 FCC Rcd 16015 (2005).

annual operating cost impact would be estimated at no less than \$7 to \$9 million.<sup>29</sup> It is not just the costs for channel frequency changes, but also for changes to multi-couplers and additional base stations.<sup>30</sup> Relocating railroad operations is estimated at \$100 million,<sup>31</sup> and transitioning AMI and Distribution Supervisory Control and Data Acquisition systems could cost between \$30 and \$50 million per electric company.<sup>32</sup>

The value created by the isolated 3/3 MHz broadband allocation is necessarily limited. As an isolated narrowband allocation, the re-banded spectrum will be less efficient and ultimately less useful than the larger commercial allocations (which as noted are available to serve this market) in the 600 MHz, 700 MHz, and 800 MHz bands. The recent 600 MHz auction sold spectrum for an average price of \$0.93/MHz-pop.<sup>33</sup> That spectrum was sold in industry-desired 5/5 MHz licenses, as part of a 70 MHz band. In contrast, the proposed 900 MHz allocation would be smaller and isolated, eliminating the economies of scale in ecosystem development. To illustrate the limited value possible, even at \$0.25/MHz-pop the 1.9 billion MHz pops created by the 900 MHz rebanding<sup>34</sup> would be worth only \$464 million. The costs illustrated by NextEra and other commentators would easily exceed this valuation, likely by many multiples.

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<sup>29</sup> NextEra Comments at 10.

<sup>30</sup> *Id.* at 3, 7.

<sup>31</sup> Comments of the Association of American Railroads, WT Docket No. 17-200, at 7 (Oct. 2, 2017).

<sup>32</sup> EEI Comments at 15.

<sup>33</sup> See, e.g., <http://www.fiercewireless.com/wireless/mapping-t-mobile-dish-comcast-and-at-t-who-got-how-much-600-mhz-spectrum-and-where>.

<sup>34</sup> 6 MHz x U.S. 2010 population of 309.3 million = 1.856 billion MHz-pops.

In sum, the proponents of reconfiguring the 900 MHz band for broadband should bear the burden of demonstrating that the value of the proposed new uses will exceed the costs created (that is, relocation and increased operational costs) necessary to create that value. The increased ongoing costs narrowband licensees will need to bear in the future because their channels will be closer together, and the costs to resolve interference by the broadband provider to narrowband users and to the adjacent 901-902/940-941 MHz narrowband Personal Communications Service (“NPCS”) band, are particularly important operational costs not adequately addressed by rebanding proponents. Because the proponents have not carried this burden, the Commission should decline to initiate a rulemaking that proposes rebanding.

**V. THE INITIAL COMMENTS CONFIRM THAT RECONFIGURING THE 900 MHZ BAND TO CREATE A BROADBAND SERVICE WOULD DISRUPT CRITICAL UTILITY OPERATIONS ON AN ONGOING BASIS.**

In its initial comments, NextEra explained that creating a new broadband segment will reduce the amount of spectrum available for narrowband operations and require repacking of traditional B/ILT licensees into a narrowband segment with frequencies (channels) more closely spaced together. This channel compression, especially in large metropolitan areas, will adversely affect system performance for incumbent B/ILT licensees adjacent to LTE operations in the proposed broadband segment. Closer spectrum spacing will require users to deploy more complex, higher loss antenna systems, which will increase the number of required sites by 200% or more.

Specifically, the cost effectiveness of FPL’s current narrowband systems is based on the ability to develop a channel plan which permits enough frequency separation between radio channels at each base station so the losses incurred in the receiver multi-coupler are minimized. The compression of its channels into the 2/2 MHz band will negatively affect FPL’s existing area of coverage. In addition, special designs are needed to avoid interference, which would require



replacement with more expensive down-tilted patterned antennas or sector antennas. When interference issues are unavoidable, it may be necessary to replace FPL's existing trunked radio system with a simulcast trunked radio network. Converting to such a complex system could double or triple the cost of FPL's existing 900 MHz network and create additional cost in order to meet FPL's radio system future expansion plans. NextEra also explained that broadband technologies tend to raise the overall noise floor in the environment in which they operate, which would reduce existing system performance levels for B/ILT licensees that are more limited in their abilities to mitigate interference issues to their 12.5 kHz narrowband channels. This is because existing 900 MHz narrowband systems are designed and operated as "noise limited" systems, meaning a few high base station sites are used to cover large geographical areas. Broadband LTE systems, on the other hand, are designed and operated as "interference limited" systems, meaning many base stations are located in closer spacing at "ground level." Interference limited systems can be appropriate for densely populated urban areas where the need for frequency reuse, large packet size data streams, and revenue generation are the driving factors. For CII entities that also operate in semi-urban and rural environments and whose focus is on small packet size bursts and emergency voice rather than revenue generation, a noise limited system design will outperform an interference limited system for similar deployment and operational costs.

Additionally, because LTE systems constantly change in power, digital receivers in adjacent narrowband spectrum require a greater (desired) signal to (undesired) noise ratio ("SNR") than analog receivers.<sup>35</sup> Although digital receivers have the ability to reject or adjust to

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<sup>35</sup>The DVA Consulting Report's discussions of interference and receiver blocking issues, DVA Consulting Report at 14 and 24, respectively, mention digital but are based on classic analog analyses and do not account for soon to be deployed narrowband digital receivers.

steady state non-correlated undesired signals, they have a difficult time with an undesired signal, like in an LTE system, which varies in power and configuration. Thus, the narrowband digital receiver is unable to lock on the desired signal and passes both the desired and undesired signals, causing increased levels of harmful interference to the digital receiver. The acceptable desired (D) signal power to undesired (U) signal power ratio (D/U) varies for narrowband digital receivers, but has been found to be the primary mechanism of failure for narrowband digital receivers operating in proximity to and in frequency bands adjacent to high power analog or digital equipment such as proposed by PDV. This D/U issue is unaddressed in the PDV proposal and must be tested and appropriate rules established prior to any consideration of the reconfiguration of this band.

Although EWA/PDV's consultant acknowledges that interference is possible ("OOBE [out of band emissions] is a legitimate concern in band realignments and especially where different technologies are adjacent"),<sup>36</sup> EWA/PDV noted that their proposed rules "do not establish an absolute right of incumbents to interference mitigation under all circumstances" and stated that incumbent narrowband licensees cannot rely on a "non-existent 'right' to no increase in the noise floor over time."<sup>37</sup> Essentially EWA/PDV confirmed that under their rebanding proposal CII narrowband incumbents will not be afforded the current level of interference protection for incumbent operators, thereby putting mission-critical CII communications networks in jeopardy, and thus incumbents will not receive "comparable facilities."

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<sup>36</sup> *Id.* at 23. While this report acknowledges the potential for interference between different technologies, it does not address the probability of an increase in interference between narrowband stations that will be repacked more closely together into fewer channels.

<sup>37</sup> EWA/PDV Comments at 31.

For example, although PDV's consultant Pericle Communications Company proposes rules "to resolve interference problems,"<sup>38</sup> its proposed rule only would require the PEBB licensee to provide advanced notice to Part 22 and B/ILT operators before turning on a broadband cell site, but the rule would not allow any protest or mitigation efforts ("The written notice shall be required only one time for each such broadband cell site and is for informational purposes only; the 900 MHz or Part 24 narrowband licensees are not afforded the right to accept or reject the activation or to unilaterally require changes in the operating parameters").<sup>39</sup> If this rule were adopted, the incumbent radio users in the 2/2 MHz band would not be able to protect their radio system from interference. The Commission should find this approach unacceptable and terminate this rebanding inquiry.

If, however, the Commission decides to go forward with any proposal to reconfigure the 900 MHz band into a broadband segment and a narrowband segment, the Commission also should consider the following factors:

- Any changes to technical rules should be based on the current noise floor environment in the 900 MHz band;
- Any changes to the 900 MHz band plan should provide operating alternatives that address the potential increase in interference to B/ILT narrowband incumbents, and incumbent licensees should not bear the burden of interference mitigation;
- Any relocation must be voluntary, and all costs incurred by existing licensees related to relocation must be reimbursed;

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<sup>38</sup> Comments of Pericle Communications Company, WT Docket 17-200, October 2, 2017, at 29-31.

<sup>39</sup> *Id.* at 31 (proposed § 90.672(d)). Pericle also suggests other revisions in proposed § 90.672 to change the definition of the median signal level from -88 dBm to -98 dBm for a mobile and from -85 dBm to -95 dBm for portables and to increase the maximum ERP of the PEBB transmitters to 1000 W/MHz in Non-Rural areas and up to 2,000 W/MHz in Rural areas. If these ERP levels were allowed, the PEBB transmitters operating in the 3/3 MHz band would need a minimum of 1 mile separation in Non-Rural areas and 2 miles separation in rural areas from a CII receiver operating in the 2/2 MHz band.

- Funding for any relocation plan must be guaranteed through the end of all relocations;
- All incumbents must also be reimbursed indefinitely for additional cost to support the increase in sites to keep coverage and service levels comparable to today's systems.
- Before the broadband 900 MHz applications are approved, the narrowband B/ILT and broadband 900 MHz licensee must come to an agreement as to how much degradation to the narrowband radio receivers is acceptable.

## VI. CONCLUSION

For the foregoing reasons, the Commission should terminate further consideration of reconfiguring the 900 MHz band to facilitate broadband operations.

Respectfully submitted,

By: \_\_\_\_\_/s/\_\_\_\_\_

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