Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

COMMENTS OF THE UTILITIES TECHNOLOGY COUNCIL

Utilities Technology Council

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Table of Contents

SUMMARY

UTC supports the Commission's efforts to promote access by utilities to broadband spectrum. Realigning the 900 MHz band to support broadband systems could help utilities and CII to meet some of their increasing communications needs, but the 900 MHz band is home to numerous utility narrowband systems that provide mission-critical communications that must be protected against interference and must be able to grow and expand as well.

UTC supports the Commission's proposals to realign the band into a 3/3 MHz broadband segment and a 1.5/1.5 MHz narrowband segment. Further, UTC also supports the Commission's proposal to designate 897.5-900.5 MHz/936.5-939.5 MHz as the broadband segment, leaving two separate narrowband segments: a 1.5/1.5 megahertz segment (896-897.5/935-936.5 MHz) below the broadband segment and a .5/.5 megahertz segment (900.5-901/939.5-940 MHz) above the broadband segment. UTC urges the Commission to allow broadband systems to use a 1.4/1.4 MHz configuration, particularly in areas where there are large and complex systems and where there would be a significant potential for interference to occur. Finally, and most importantly, UTC supports the Commission's proposal for a voluntary exchange approach that would provide the incumbent licensees with relocation to comparable facilities and reimbursement of all of their relocation costs.

UTC urges the Commission to adopt rules that would protect against interference to narrowband systems within the 900 MHz band and in the adjacent Narrowband PCS band. Specifically, UTC supports the Commission's proposal to provide 500 kilohertz frequency separation between the broadband segment and the Narrowband Personal Communications Service (PCS) band. Similarly, UTC urges the Commission to adopt 500 kilohertz separation

where the broadband segment uses a 1.4/1.4 MHz configuration. In such circumstances where there is insufficient spectrum for such frequency separation, UTC urges the Commission to develop innovative solutions to protect narrowband systems from interference.

UTC urges the Commission to adopt eligibility rules for the broadband segment that would allow utilities and other B/ILT entities to apply for 900 MHz broadband licenses. This would remove barriers that would otherwise prevent utilities from becoming broadband licensees, contrary to the public interest as well as the interest of utilities who need access to licensed broadband spectrum to provide the reliability and capacity that they need to support their increasing communications needs. At the same time, UTC urges the Commission to adopt rules for the narrowband segment that would limit eligibility exclusively for B/ILT entities. This would ensure that B/ILT licensees who need it most have access to sufficient spectrum to relocate to the 1.5/1.5 MHz narrowband segment, and it would help prevent potential speculation and warehousing of spectrum. Furthermore, UTC urges the Commission to provide utilities and other CII to provide priority access to available narrowband segment channels. This would be consistent with Commission precedent, and it would help to minimize the disruption of mission-critical communications by utilities and CII during the transition.

Finally, UTC supports other technical rules to protect against interference including adjacent channel interference rules and out-of-band-emission limits, as well as rules for "unacceptable interference" based upon the Commission's existing limits that apply to mobile and portable equipment operating in the 800 MHz band.

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Pursuant to Section 1.405 of the Commission's Rules, the Utilities Technology Council ("UTC") hereby files its comments in response to the Commission's Notice of Proposed Rulemaking in the above-referenced proceeding.[1] In preparation for this rulemaking, UTC's members crafted a policy resolution in July 2018 that expresses support for promoting utility access to broadband below 1 GHz to meet utilities' increasing communications needs. The resolution also urges the FCC to consider technological, financial and regulatory solutions to protect incumbent utility narrowband communications systems while also allowing for development of broadband systems. Items to be considered include, but are not limited to: conducting field testing to demonstrate interference between the wide band and narrow band systems, identifying interference levels and impacts to incumbent systems coverage, and establishing guard bands to mitigate interference issues.

UTC's members support the Commission's efforts to provide utilities with access to broadband spectrum, which is needed to enable utilities to meet increasing communications requirements associated with smart-grid technologies and cybersecurity threats. Realigning the 900 MHz band to support broadband would provide utilities with an opportunity to access

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[1] Review of the Commission's Rules Governing the 896-901/935-940 MHz Band, *Notice of Proposed Rulemaking*, WT Docket No. 17-200 (Mar. 14, 2019)(hereinafter "*NPRM*").

licensed spectrum with favorable propagation and greater capacity. It must be noted, however, that the amount of bandwidth available for broadband in the 900 MHz band will be limited, and it will be further constrained by the need to preserve sufficient spectrum for current and future needs for narrowband systems and to protect them from interference.

The 900 MHz band is home to numerous narrowband systems that are used by utilities and other critical infrastructure industries to provide reliable voice and data communications that are essential for ensuring the safe, reliable and secure delivery of energy and water services. The Commission must ensure that narrowband systems in the 900 MHz band are protected against harmful interference and are able to expand capacity and coverage to meet their future needs. UTC is committed to pursuing technical solutions that will allow broadband and narrowband operations in the 900 MHz band to coexist and we look forward to working with the Commission to make that happen. UTC has launched efforts to work with utilities and providers of 900 MHz narrowband and LTE equipment to test and determine if there is a successful means for narrowband and broadband systems to coexist in a non-interfering manner as defined in the NPRM. Accordingly, UTC provides the following comments to describe how the Commission's rules can both support access to broadband spectrum in the 900 MHz band while at the same time protect existing narrowband operations from interference.

I. Introduction

UTC is the international trade association for the telecommunications and information technology interests of electric, gas and water utilities, pipeline companies and other critical infrastructure industries. Its members include large investor-owned utilities that may serve millions of customers across multi-state service territories as well as small electric cooperatives or public power utilities that may serve only a few thousand customers in rural areas and isolated

communities across America. All of these members own and operate their own private internal communications networks which they use to support the safe, reliable and secure delivery of essential services. Owing to the critical nature of the underlying services that utilities provide, their communications networks are designed, built and maintained to high standards for reliability and resiliency. These communications networks include extensive wireline and wireless systems that can cover entire utility service territories.

Many utilities operate narrowband communications networks in the 900 MHz land mobile bands, as well as in the adjacent Narrowband PCS channels, which are potentially affected by the Commission's NPRM in this proceeding. These networks provide mission-critical voice and data services for day-to-day operations and emergency restoration in the aftermath of hurricanes and other events. Utilities rely on these networks and have invested hundreds of millions of dollars in them. In addition, utilities lack reasonable alternatives to using this spectrum, because it is uniquely suited to providing wide-area, reliable narrowband communications, given that the Commission's rules ensure protection against co-channel and adjacent channel interference to licensed operations in the band.

Some utilities are also interested in exploring the potential of using the 900 MHz band to support broadband operations. As UTC has commented in various Commission proceedings, utilities currently lack access to licensed broadband spectrum. Moreover, they are under increasing demands for access to licensed broadband spectrum to support smart grid and cybersecurity requirements, as well as other utility applications. While utilities can and do currently use unlicensed operations and commercial communications services to support some of their needs, these tend to be less reliable than using licensed spectrum for private internal communications networks. Utilities also need access to licensed broadband spectrum to support

further implementation of grid modernization technologies, such as distributed automation, which will improve the reliability and resilience of their services, as well as video monitoring and stronger cybersecurity capabilities to protect against potential vulnerabilities and actual attacks against their critical infrastructure. It must be noted that 3 MHz of broadband is not capable of meeting all of these needs. As such, realigning the 900 MHz band to support broadband operations could help to enable utilities to meet some of their increasing capacity and coverage communications requirements.

UTC's members are directly and substantially affected by the instant NPRM and UTC is hereby filing the following comments on behalf of their interests in promoting the use of the band for broadband by utilities and protecting utility narrowband operations against interference. We support the Commission's efforts to promote utility access to broadband spectrum but maintain that utility narrowband communications systems must be protected against interference. This will serve the public interest in improving the safety, reliability and security of critical infrastructure communications. UTC looks forward to working with the Commission as it moves forward in this proceeding.

II. Broadband Segment Size

In the NPRM, the Commission proposes to realign the 900 MHz band and invites comment on the proposed 3/3 megahertz size of the broadband segment.[2] In response, UTC comments that realigning the band to support a 3/3 MHz broadband segment would help to support private LTE for utilities and provide greater throughput to support increasing capacity requirements for smart grid and other utility applications. UTC agrees with the Commission's assessment that a 3/3 megahertz broadband link would have "relatively limited capacity and

[2] *NPRM* at ¶¶9-10.

speed compared to existing nationwide and regional 4G networks and, by itself, will not be able to serve direct-to-consumer demand in densely populated areas," and further that "this spectrum is more likely to be used to serve PLMR customers."[3] UTC believes that a 3/3 MHz broadband segment is the most appropriate size at this time in order to accommodate utilities' increasing capacity requirements while at the same time preserving spectrum for narrowband utility communications needs. If there are certain areas with large complex incumbent systems where deploying a 3/3 MHz broadband system may not be appropriate due to interference concerns, the Commission should permit broadband systems to deploy a 1.4/1.4 MHz configuration in such areas, while maintaining the 3/3 MHz broadband segment allocation.

While a 3/3 broadband segment would not provide sufficient capacity to support all their needs into the future, it would help to meet utilities' current needs, particularly for field area communications where utilities need both capacity and coverage. In addition, it would help to promote reliability by providing access to licensed spectrum, which is necessary for utility mission-critical communications. In that regard, UTC echoes the comments on the record (including its own) stating that access to licensed broadband spectrum is necessary because it provides protection against interference, and other alternatives such as unlicensed operations and commercial services do not provide the same level of reliability as private utility networks. As such, a 3/3 MHz segment would help to support the basic utility communications requirements for capacity, coverage and reliability.

[3] *Id.* at ¶12.

III. Allocation of the 900 MHz Band

In the NPRM, the Commission proposes to replace the Land Mobile Service allocation in the 900 MHz band with a Mobile Except Aeronautical Mobile Service allocation on a co-primary basis with the Fixed Service, and believes that the proposed framework meets the requirements for the allocation of flexible use spectrum under section 303(y) of the Communications Act.[4] UTC agrees with the Commission's proposal for the allocation and its assessment that the proposed framework would satisfy the three-part test laid out under section 303(y) of the Communications Act. First, the allocation would promote access to broadband spectrum for private land mobile operations, including utility communications networks. Second, provided that the Commission's rules protect narrowband incumbents in and adjacent to the 900 MHz band, the allocation would not deter investment in communications services and systems, or development of technologies. Third, the 3/3 broadband segment can be implemented in such a way that it would not result in harmful interference among users, as described in further detail herein.[5] In this regard, UTC recognizes that there are areas where it may not be appropriate to deploy a 3/3 MHz broadband system due to the presence of large and complex narrowband systems. In this respect, UTC qualifies its general support for the proposal by the FCC for a 3/3 MHz configuration.

IV. The Location of the Broadband Segment

The Commission proposes to designate 897.5-900.5 MHz/936.5-939.5 MHz as the broadband segment, leaving two separate narrowband segments: a 1.5/1.5 megahertz segment

[4] *Id.* at ¶¶13-14.

[5] *See* Section 303(y) of the Communications Act of 1934 as amended, requiring that the Commission find that (1) the allocation is in the public interest; (2) the allocation does not deter investment in communications services and systems, or development of technologies; and (3) such use would not result in harmful interference among users.

(896-897.5/935-936.5 MHz) below the broadband segment and a .5/.5 megahertz segment (900.5-901/939.5-940 MHz) above the broadband segment.[6]

A. UTC supports the Commission's proposed location for the broadband segment, and it urges the Commission to adopt frequency separation and develop other innovative solutions to protect narrowband systems from interference.

In response, UTC supports this proposal and believes that the Commission should adopt its proposal for a consistent 3/3 MHz segmentation that would promote the use of the band for broadband while also protecting narrowband systems from interference. Alternatively, UTC recommends that the Commission permit broadband licensees with the option of deploying systems in a 1.4/1.4 MHz configuration within the 3/3 MHz broadband segment. Furthermore, UTC recommends that this segmentation should be made on a regional rather than a national basis, which would be consistent with the way systems using the broadband segment would likely be deployed as a practical matter. This would provide the added benefit of preserving spectrum for narrowband operations on a regional basis where a broadband licensee decides to use a 1.4/1.4 MHz configuration or where no broadband licensee chooses to deploy a system at all.

UTC agrees with the Commission that it is necessary to provide frequency separation between the broadband segment and operations on the Narrowband PCS channels that are adjacent to the 900 MHz band. In that regard, UTC recommends that the amount of frequency separation should be no less than 500 kHz to protect against co-channel interference to operations on the Narrowband PCS channels. Comments on the record also support the

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[6] *NPRM* at ¶15.

establishment of such a guard band to protect against adjacent channel interference to operations on the Narrowband PCS channels, including many large and important utility systems.

Similarly, UTC also recommends providing 500 kilohertz of frequency separation between the broadband segment and the narrowband segment within the 900 MHz band. Currently, the Commission's proposal does not provide any separation between the narrowband and broadband segments within the 900 MHz band. UTC notes that in areas where a broadband licensee uses a 1.4/1.4 MHz configuration of the broadband segment, there would be sufficient spectrum available to provide 500 kilohertz of frequency separation between the edge of the broadband segment and the narrowband segment of the band. In such circumstances where there is insufficient spectrum for such frequency separation, UTC urges the Commission to develop innovative solutions to protect narrowband systems from interference.[7] Moreover, in order to provide sufficient access to interference spectrum for utilities and CII, UTC recommends that the Commission limit eligibility to B/ILT entities and provide utilities and other CII with priority access to available channels in the narrowband segment, as described in more detail below.

Provided that the Commission offers sufficient spectrum in the narrowband segment for utilities and CII and other B/ILT entities to meet their current and future needs and protects them against interference from broadband operations, UTC supports the Commission's proposal for a consistent 3/3 MHz segmentation approach to realigning the band in general, which would benefit utilities by helping them meet their broadband needs.[8] While utilities continue to rely on

[7] If a broadband licensee decides to deploy two 1.4/1.4 channels together in the 3/3 MHz broadband segment, there would not be sufficient space for a 500 kHz frequency separation from the narrowband segment. In such a circumstance, the 500 kHz frequency separation would not apply, but UTC reiterates that the Commission should consider innovative solutions to protect against adjacent channel interference to operations in the narrowband segment.

[8] *See NPRM* at ¶18 (requesting comment on "the extent to which our proposal would benefit current narrowband users by helping them meet their broadband needs.")

narrowband private internal radio communications systems for mission-critical operations, many need additional wideband or broadband spectrum to meet their increasing communications capacity requirements.[9] As the Commission itself has observed, electric and other utilities need broadband capacity to support smart grid and other next generation communications systems.[10] In addition, access to broadband capacity would help the oil and natural gas industry, which expects to deploy thousands of Internet of Things (IoT) devices for its critical systems but struggles to find reliable and secure commercial networks.[11] Given the importance of the essential energy and water services that utilities and oil and natural gas companies provide, UTC urges the Commission to promote the ability of these types of critical infrastructure industry (CII) entities to access broadband spectrum in the 900 MHz band, while protecting their existing narrowband operations against disruption during relocation, as further described below.

V. Newly Designated Narrowband Segment.

A. The Commission should provide utilities and other CII with priority access to the narrowband segment and limit eligibility exclusively to B/ILT entities.

The Commission proposes to designate the 896-897.5/935-936.5 MHz and 900.5-901/939.5-940 MHz bands for site-based operations and to eliminate the distinction between B/ILT and SMR operations in this narrowband segment of the band.[12] In that regard, the Commission invites comment on rule modifications that may be necessary to facilitate band

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[9] *Id.* (stating that "Electric and other utilities need broadband capacity to support smart grid and other next generation communications systems."). *See also Id., citing* Comments of Western Farmers Electric Cooperative (finding that after conducting an 18-month engineering study to assess its long-term telecommunications requirements, Western Farmers Electric Cooperative concluded that its future needs cannot be met by traditional networks that lack broadband capacity.)

[10] *Id.*

[11] *Id.*

[12] *Id.* at ¶19.

realignment and the creation of separate narrowband and broadband segments, including how the Commission should grant access to the narrowband segment and determine eligibility for narrowband segment licenses.[13]

1. Priority Access for Utilities and CII to the Narrowband Segment

UTC urges the Commission to provide utilities, oil and gas companies, water utilities and other CII that must relocate to the narrowband segment of the band with priority access to available channels in a given area. This will ensure that they have access to available spectrum so that any disruption to their systems during relocation is minimized. This will also serve the public interest in ensuring the safe, reliable and secure delivery of the underlying essential energy and water services that utilities and oil and gas companies provide. There is well-established precedent for providing priority access to available narrowband channels for CII during relocation and this precedent would apply with equal force to the relocation of CII incumbents in the 900 MHz band.

As a practical matter, providing priority access to 900 MHz narrowband channels during relocation can be accomplished in much the same way that the Commission provided public safety and CII with priority access to available spectrum during 800 MHz rebanding. The Commission could simply provide a certain period of time at the beginning of the relocation period for these CII companies to modify their licenses and retune their systems to operate on available narrowband channels outside of the broadband segment of the band in a given area. After that, other incumbent licensees who are not CII could be permitted to access remaining available narrowband channels. This would ensure the orderly relocation of incumbent

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[13] *Id.*

narrowband licensees and reduce the potential for disruption to their communications systems during the transition.

As a policy matter, the same public interest considerations that applied during 800 MHz rebanding for providing utilities and CII with priority access to available channels would apply here as well. Just as the Commission concluded that priority access for CII during 800 MHz rebanding served the public interest in protecting essential energy and water services against disruption, the Commission should also conclude that priority access to available 900 MHz channels by CII would similarly serve the public interest. Moreover, the same underlying technical considerations apply here, because it is very likely that there may not be sufficient narrowband channels in certain areas for all incumbents to relocate into the narrowband segment, particularly if the narrowband segment is a 1.5/1.5 MHz configuration instead of 2/2 MHz. Finally, the Commission should also use the same definition of CII that it developed for 800 MHz rebanding.[14] Accordingly, UTC urges the Commission to provide priority access for CII to relocate incumbent systems to available narrowband channels in the 900 MHz band.

2. Limiting Eligibility for B/ILT Entities in the Narrowband Segment.

In response, UTC urges the Commission to limit eligibility exclusively to B/ILT entities to access licenses in the narrowband segment of the 900 MHz band. UTC is concerned that there will be insufficient spectrum available in the narrowband segment to complete relocation. Moreover, UTC is concerned about the potential for speculation and warehousing of the narrowband segment by SMRs, if they are eligible. This would complement the approach of

[14] *See* 47 C.F.R §90.7 (defining "Critical Infrastructure Industry (CII)" as "[s]tate, local government and non-government entities, including utilities, railroads, metropolitan transit systems, pipelines, private ambulances, volunteer fire departments, and not-for-profit organizations that offer emergency road services, providing private internal radio services provided these private internal radio services are used to protect safety of life, health, or property; and are not made commercially available to the public.")

providing priority access to narrowband channels for utilities and CII (as described above), and would serve the public interest for several reasons.

First and foremost, this would help to ensure sufficient spectrum is made available for relocation of B/ILT licensees, who are likely to be the ones that are principally affected by the transition of the 900 MHz band. The Commission should establish eligibility restrictions in general to conserve the availability of spectrum. Moreover, limiting eligibility exclusively to B/ILT licensees will further help to ensure they have access to narrowband spectrum for current and future needs. It makes little sense as a matter of equity to make SMR entities eligible for the narrowband segment because they will be able to avail themselves of broadband spectrum, unlike most B/ILT licensees that are not positioned to meet the Commission's proposed eligibility requirements for the broadband segment. Moreover, the few SMR licensees that do need to relocate to narrowband spectrum could use the 800 MHz band, where there are interstitial channels, as well as Expansion Band and Guard Band channels that are currently being made available. For all of these reasons, UTC urges the Commission to limit eligibility exclusively to B/ILT licensees to access the narrowband segment of the 900 MHz band.

3. Other Potential Rule Changes for Systems in the Narrowband Segment.

In addition, UTC believes that the Commission should consider changing the technical rules to address potential problems that have been raised on the record regarding congestion and interference resulting from compressing incumbent narrowband operations into a 1.5/1.5 MHz or 2/2 MHz segment and locating that segment adjacent to the broadband segment. Specifically, the Commission should consider rule changes designed to provide sufficient frequency separation between narrowband systems to allow incumbents to continue to use frequency combiners

without having to change them out or otherwise alter their operation.[15] Similarly, the Commission should consider rule changes that may be necessary in order to overcome a rise in the noise floor that may result from either co-channel or adjacent channel systems.[16] Likewise, the Commission may need to consider rule changes to address the potential for front-end overload that may result from the location of the FCC's proposed broadband segment.[17] Finally, the Commission should consider rule changes that would provide a guard band, or other solution providing sufficient interference protection, between the narrowband and broadband segments of the band or alternatively establish more stringent out-of-band emission limits coupled with adjacent-channel interference protections that may be necessary to protect narrowband systems from interference from broadband systems. In that regard, UTC notes that the Commission's proposed band plan provides a guard band for Narrowband PCS operations adjacent to the 900 MHz band, but it fails to recognize the need for a guard band to protect systems within the proposed narrowband segment of the band. UTC recommends that the Commission continue to monitor developments in the proposed narrowband segment of the band to determine if other changes to the technical rules become necessary to address the potential for interference that may occur between narrowband systems, as well as interference between adjacent broadband and narrowband operations.

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[15] Generally, combiners require a minimum frequency separation of 100 kHz between transmit and receive channels, which may be difficult to achieve if only 1.5 MHz is available in the narrowband segment of the 900 MHz band. *See*, Holmes, Wayne, "Choosing Frequencies and RF Filtering Equipment" (2013) *available at* https://cwh050.blogspot.com/2013/04/choosing-frequencies-and-rf-filtering.html.

[16] Gillespie Prudhon & Associates, Inc., "900 MHz NOI Proposed Rebanding: Engineering Report, 900 MHz LMR Spectrum Issues with Repurposing," WT Docket No. 17-200 *available at* https://ecfsapi.fcc.gov/file/109211865122815/GP%26A%20Report%20for%20NextEra%20092118-c1.pdf. (describing how additional sites would be required to provide the same coverage necessary to overcome the rise in the noise floor resulting from compressing narrowband systems into the narrowband segment of the band.)

[17] An alternative configuration of the broadband uplink and downlink may help to mitigate the effect of this type of interference to narrowband systems.

VI. An Alternative Realignment

The Commission invites comment on possibly realigning the entire band into a 5/5 MHz broadband channel, including whether to do so on a nationwide or localized basis. Alternatively, the Commission invites comment on realigning the band into a 1.4/1.4 MHz configuration coupled with larger protection bands between broadband and narrowband operations.

A. The Commission Should Permit Broadband Systems to Use a 1.4/1.4 MHz Configuration.

UTC believes that the Commission should permit – but not require – broadband systems to use a 1.4/1.4 MHz configuration in certain areas if the licensee chooses to do so. Although UTC is concerned that a 1.4/1.4 MHz configuration may not provide sufficient capacity for current utility requirements, let alone future requirements, it supports the option for utilities and others to deploy 1.4/1.4 MHz systems. This would enable greater flexibility to accommodate both narrowband and broadband operations through various configurations and guard bands, thereby mitigating the potential for interference. It may also enable utilities and others to increase capacity incrementally and gradually transition to a full 3/3 MHz configuration later. Accordingly, UTC supports the option for utilities and others to deploy broadband systems in a 1.4/1.4 MHz configuration, but the Commission should not adopt such a configuration and require that it be implemented uniformly nationwide. It should be noted that some utilities view transitioning to a 1.4/1.4 MHz configuration as a way of validating that interference can be addressed and that there truly is market interest for broadband services in a given area.

VII. Geographic Area Licensing.

The Commission proposes geographic area licensing of the broadband segment of the band and suggests basing the size of the geographic licenses on counties. In response, UTC supports licensing the broadband segment using geographic areas based on counties. However,

UTC opposes using larger geographic areas (i.e. compared to counties), which would make it more difficult for utilities to acquire licenses and to work around incumbent narrowband systems. Larger geographic areas such as Major or Partial Economic Areas could discourage or prevent utilities from acquiring broadband licenses if they were unable to meet the Commission's eligibility requirements and/or construct in areas that they do not serve. Larger areas also would make it harder to coordinate with incumbent systems, thereby requiring them to relocate and further resulting in unnecessary disruption to their communications. Counties provide the added benefit of being narrowly tailored to conform to the service territories of utilities, and they are larger where they need to be in rural areas that need broader coverage compared to urban and suburban areas that tend to be more targeted. Finally, licensing 900 MHz broadband spectrum by county would help foster flexible and innovative use of the band in all areas by providing a consistent, relatively small license size appropriate for a wide range of possible network deployments.

VIII. A Market-Driven, Voluntary Exchange Process

The Commission proposes a market-driven, voluntary exchange process for the transition.[18] Under this approach, the Commission proposes eligibility requirements. Specifically, the Commission proposes that broadband license applicants (1) Hold licenses covering the entire county for all 20 geographically-licensed SMR blocks, (2) Reach an agreement to clear from the broadband segment, or demonstrate how it will protect, all covered incumbent licensees, and (3) Agree to return to the Commission all 900 MHz licenses for the relevant county, including any site-based B/ILT or SMR licenses.[19] Alternatively, the

[18] *Id.* at ¶26-27.

[19] *Id.* at ¶29.

Commission invites comment on whether to allow a licensee to use any combination of 900 MHz spectrum (e.g., B/ILT and/or SMR) to be eligible for a new broadband license, provided that such spectrum totals at least 5 megahertz and covers the entire county for which it seeks a license.[20]

A. UTC Supports a Voluntary Exchange Approach and Urges the Commission to Expand Eligibility in the Broadband Segment to Include B/ILT Entities.

In response, UTC supports the Commission's proposal to rely on a market-driven approach through which 900 MHz licensees may engage in voluntary exchange mechanisms to facilitate clearing of the broadband segment. UTC insists that incumbents be provided comparable facilities and reimbursement for their relocation costs. A transition coordinator would be helpful to support the voluntary relocation process and to help resolve any disputes that arise from the negotiations. UTC believes that this approach would take advantage of the speed and efficiency of voluntary realignment through private agreements between incumbents.[21] In addition, this approach would serve the public interest because it would not force utilities and other incumbents to move, thereby mitigating the impact on system operation. Finally, this approach is designed to protect the public interest in narrowband PLMR systems, which the Commission recognizes.

Although UTC supports the Commission's market-driven voluntary approach, it opposes its proposal for eligibility, which would unfairly favor SMR licensees over B/ILT licensees as applicants for broadband licenses. The premise behind the Commission's decision to favor SMR licensees is fundamentally flawed and the proposal is at odds with its open eligibility spectrum

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[20] *Id.* at ¶28.

[21] *Id.* at ¶26.

policies in general. The premise is flawed because it focuses on SMR licensees to the exclusion of B/ILT licensees, and it operates from an attempt to minimize the amount of spectrum that the Commission would need to contribute out of reserve in order to create a 3/3 MHz block of spectrum (i.e. 1 MHz).[22] In reality, B/ILT licensees are just as qualified (perhaps more so) as SMR licensees to become broadband licensees, and they could assemble 5 MHz of spectrum by combining their spectrum with those of others (including SMR licensees). Moreover, the proposal is at odds with the Commission's open eligibility policies generally, because it would limit eligibility to SMR entities. This would enable them to leverage their market control over B/ILT licensees, who would be forced to take service from them if they wanted to use the 900 MHz band for broadband. It would also create additional windfalls for SMR licensees, contrary to the public interest.

Instead, UTC urges the Commission to adopt its alternate approach that would allow a licensee to use any combination of 900 MHz spectrum (e.g., B/ILT and/or SMR) to be eligible for a new broadband license, provided that such spectrum totals at least 5 megahertz and covers the entire county for which it seeks a license.[23] This would provide additional flexibility to enable utilities and other B/ILT licensees to be able to become broadband licensees either individually or in partnership with an SMR licensee. In this regard, UTC also seeks clarification from the Commission that a utility that acquires spectrum from an SMR licensee on the secondary market may also be eligible to become a broadband licensee. In addition to providing flexibility, this policy also would be consistent with the Commission's policies that are generally

[22] *See NPRM* at ¶30 (explaining that the Commission's proposal to favor SMR entities for eligibility to become broadband licenses is "designed to minimize the amount of spectrum the Commission must grant from inventory in order to create the 3/3 megahertz broadband license.")

[23] *Id.* at ¶28.

designed to maximize the use of the spectrum. In addition, allowing utilities to compete for access to this broadband spectrum would promote the public interest in improving the safety, reliability and security of the underlying essential energy and water services that utilities, oil and natural gas companies and other CII provide and that are supported by their private internal wireless communications networks. Therefore, the Commission should adopt its alternative proposal to allow B/ILT licensees as well as SMR licensees to become eligible to hold a broadband license in the 900 MHz band, provided that they provide a total of at least 5 megahertz of spectrum that covers the entire county for which they seek a license.

In any event, UTC supports the remaining eligibility requirements that broadband applicants must demonstrate that they reach an agreement to clear from the broadband segment, or demonstrate how they will protect, all covered incumbent licensees, and agree to return to the Commission all 900 MHz licenses for the relevant county, including any site-based B/ILT or SMR licenses.[24] These private agreements should at a minimum provide the details of the mitigation of potential impact such as 1) Replacement of lost narrowband frequency pairs 2) Outline methods of monetary compensations for rebanding efforts and to assist replacement of lost narrowband frequencies and 3) Provide a temporary means of operating on a narrowband basis while guaranteeing broadband licenses to utilities for future operations. UTC believes that it is critical that applicants show that they will either protect all covered incumbent licensees or clear the broadband segment (i.e. relocate them). Incumbent licensees must be protected fully against interference from broadband licensees. UTC also supports the Commission's definition of "covered incumbents" who must be protected, which must include licensees with systems within 70 miles from the proposed broadband system. UTC does not support using a contour

[24] *Id*. at ¶32.

analysis to determine who are or who are not "covered incumbents," because it could lead to manipulation and subjective analysis by the broadband applicant.[25]

IX. Applications

The Commission proposes that an application seeking a 900 MHz broadband license must include: (1) a certification that the applicant satisfies the eligibility requirements (Eligibility Certification), and (2) a plan for transitioning the band in the particular county (Transition Plan) that describes the private agreements between the prospective broadband licensee and all covered incumbents. Further, the Commission proposes that the Eligibility Certification must list the licenses the applicant holds for all 20 geographically licensed SMR blocks, as well as the covered incumbents with which the applicant negotiated the Transition Plan for that county. Finally, the Commission proposes that the Transition Plan must describe in detail all information and actions necessary to accomplish the realignment, including: (1) The frequencies within the broadband segment that the prospective broadband licensee seeks from Commission inventory, (2) The rights to all 20 geographically-licensed SMR blocks, and any site-based SMR or B/ILT licenses in the county that the licensee is relinquishing, (3) The applications that the parties to the agreement will file for spectrum in the narrowband segment in order to relocate or repack licensees, (4) A description of how the applicant will provide interference protection to, and/or relocate from the broadband segment, all covered incumbents, and (5) Any rule waivers or other actions necessary to implement the agreement.[26]

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[25] *Id.* at ¶33 (inviting comment on alternatives to using a 70 mile separation distance metric, including requiring a prospective broadband licensee to "demonstrate eligibility by clearing incumbents with a service or interfering contour that intersects the county boundary of the prospective broadband license.")

[26] *Id.* at ¶35.

A. UTC Supports the Proposed Application Process and Suggests Certain Modifications, Including the Proposed Exclusion from Mandatory Relocation.

In response, UTC generally supports the Commission's proposed application process, but it suggests that the Commission make certain important modifications. First, the Commission should require that the applicant provide the timeline for its deployment as part of its plan for clearing or protecting incumbents. Second, the Commission should not assume that the applicant would be an SMR licensee rather than a B/ILT licensee or a combination of both. UTC urges the Commission to consider how this process would apply if the applicant was a B/ILT licensee, instead of an SMR licensee. Finally, the Commission should consider how the application process would account for governmental entities – who are auction-exempt. Those issues aside, the process that the Commission has proposed is generally thorough and should ensure that broadband applicants demonstrate that they have a plan and the details of how it will work. In turn, that should ensure that they have sufficient spectrum to meet the eligibility requirements and that they will either protect or clear incumbent narrowband licensees in the band.

UTC is concerned by the Commission's suggestion in the NPRM that a broadband applicant should be permitted to invoke mandatory relocation under circumstances where it holds a certain percentage of the spectrum in a county but where there are incumbent licensees that have not agreed to relocate from the remaining amount of spectrum. First, it is speculative to assume that holdouts will present a significant problem where the Commission would need to develop a separate process to force incumbents off of their channels. Second, the Commission's suggested process assumes that the applicant has engaged in good faith negotiations with the incumbent and that the terms of negotiation are reasonable. Third, the process lacks sufficient safeguards to prevent broadband applicants from subverting voluntary negotiations in order to

skip to mandatory relocation.[27] UTC submits that this mandatory relocation process is vague and requires much more detail than the Commission has provided in the NPRM.

The only exception to the Commission's suggested mandatory relocation process would be for "complex systems" which the Commission defines as systems with 65 or more integrated 900 MHz sites.[28] Here again, UTC underscores that the Commission should revise this exception to clarify that it should apply to systems with 25 or more sites. In addition, the exemption should also factor in the nature of the use of these systems. For example, utilities use these 900 MHz systems to support public safety communications as well as communications with nuclear power stations. Certainly, the Commission would not want such systems to be subject to mandatory relocation. Finally, UTC is concerned that the term "integrated" is undefined and could potentially lead to conflicting interpretations. Accordingly, UTC suggests removing the term "integrated" and simply refer to the number of sites in the system as the basis for the exclusion. Alternatively, UTC suggests defining "integrated" systems as being centrally controlled.

In quantitative terms, UTC is concerned that the Commission's proposal sets an unreasonably high threshold for the number of sites needed to meet the definition of a complex system. Instead of 65 sites as the Commission has proposed, UTC urges the Commission to set the threshold number at 25 sites. This would be more consistent with commonly understood

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[27] All that is required under the FCC's suggested mandatory relocation process is that the broadband licensee demonstrate protection or agreement with incumbents controlling 90% of the channels in a county (in the first year) or 80% of the channels (in the second year). Alternatively, the Commission is considering allowing mandatory relocation where the prospective broadband licensee holds more than 3 megahertz uplink and 3 megahertz downlink in the 900 MHz band (across the county including both SMR and site-based licenses). Note that the Commission is not sure how it would calculate the site-based spectrum holdings. There is a great deal of uncertainty how these thresholds would be calculated, and the Commission itself has invited comment on this issue.

[28] *Id.* at 38.

industry practices and terminology regarding "complex systems". It would also serve the underlying purpose of the exclusion, which is to prevent mandatory relocation of systems that could involve more complex considerations and are not just "hold outs" that could easily relocate. Accordingly, UTC suggests that the Commission define a complex system as:

> A system that has a central means of controlling the entire system through a network allowing operability across all sites. The system is comprised of more than 25 sites, may span large geographic areas while bridging together non-contiguous areas, and may have large channel capacity on a site by site basis.
>
> A complex system can also involve direct public communications involving high risk with direct ties to public well-being. For example, a siren/public notification system supporting nuclear or a water monitoring and control systems integrated as part of a private land mobile radio system.

For all these reasons, reducing the number of sites to 25 and eliminating or clarifying the term "integrated" would make the exclusion from mandatory relocation more reasonable, practical and effective.

X. Procedures

The Commission proposes to commence the voluntary exchange process by issuing a public notice opening a filing window to accept applications consistent with the proposed eligibility and application requirements.[29] In response, UTC supports the proposed process for commencing the voluntary exchange process and suggests that the filing window should be held open for a period of at least two years. As the Commission is well aware from the 800 MHz rebanding process, the negotiation process can take a significant amount of time, particularly for complex systems that may involve multistate service territories and which must be considered together during the relocation process. Moreover, a two-year period would be consistent with

[29] *Id.* at 39.

the Commission's precedent in the context of the process for 2 GHz microwave relocation. There, the Commission provided at least two years for mandatory negotiations.[30]

XI. Licensing and Operating Rules

As discussed previously in these comments, the Commission proposes to designate the 900 MHz broadband service as a Miscellaneous Wireless Communications Service governed by Part 27 of the Commission's rules, and it requests comment on whether any of the general Part 27 rules need to be modified for the 900 MHz band realignment.[31] In that regard, the Commission reiterates that it proposes to establish eligibility rules under its market-based, voluntary exchange process for transitioning the band.[32] It invites comment on whether it should adopt open eligibility, and it observes that Commission has determined with respect to a number of services that eligibility restrictions on licenses should be imposed only when open eligibility would pose a significant likelihood of substantial harm to competition in specific markets and when an eligibility restriction would be effective in eliminating that harm.[33]

A. UTC Opposes Open Eligibility and Supports Limiting Eligibility to B/ILT and SMR Entities to Access the Broadband Segment.

In response, UTC generally supports the Commission's proposal to designate the 900 MHz broadband service as a Miscellaneous Wireless Communications Service governed by Part 27 of the Commission's Rules. In this regard, the Commission must ensure that Part 27 permits private systems, rather than exclusively commercial broadband systems. UTC also supports the

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[30] *See* 47 C.F.R. § 22.602.

[31] *NPRM* at ¶56.

[32] *Id.*

[33] *Id.* at ¶57.

proposed license term for broadband licenses, as described below. However, UTC opposes open eligibility and it suggests modifying the proposed performance requirements, as more fully described below. UTC emphasizes and reiterates that B/ILT entities should be eligible to hold broadband licenses in the 900 MHz band. In addition, UTC requests that the Commission develop performance requirements that are based on geographic coverage, rather than population coverage.

UTC opposes open eligibility if the Commission adopts an overlay or incentive auction approach for realigning the band.[34] Instead, UTC supports the Commission's proposed voluntary exchange approach towards transitioning the 900 MHz band and it conditionally supports eligibility for B/ILT as well as SMR entities to hold broadband licenses as described above in UTC's comments. There are several reasons why UTC opposes the use of open eligibility for overlays and auctions. First, there is a significant likelihood of substantial harm to competition in specific markets and limiting eligibility to B/ILT and SMR eligible entities would be effective in eliminating that harm. As the Commission acknowledges, this band is more likely to be effectively used for private wireless, and limiting eligibility for broadband licenses to B/ILT and SMR entities would ensure that they would have access to spectrum that they desperately need and would put to effective use.[35] By contrast, open eligibility could lead to speculative attempts to warehouse spectrum and hold it for ransom, rather than to actually use it. Second, if the band is auctioned, limiting eligibility to incumbent licensees would ensure that they would be able to compete for the spectrum, which has been a big problem for utilities and other private entities in

[34] *Id.* at ¶57 (inviting comment on open eligibility if the Commission adopts an overlay or incentive auction approach for realigning the band).

previous auctions. Therefore, UTC urges the Commission to limit eligibility to incumbent B/ILT and SMR licensees in the 900 MHz band.

B. UTC Supports a 15-Year Term for 900 MHz Broadband Licenses.

The Commission proposes to adopt a 15-year term for licenses in the 900 MHz broadband segment.[36] UTC supports this proposal because it will enable licensees to have sufficient time to meet their buildout requirements in their initial license period. Although license terms are typically 10 years, more time may be necessary to deploy a broadband network in the 900 MHz band because it will be substantially more complex, expensive and time consuming than deploying a narrowband system. Also given the Commission's proposals for performance requirements and the penalties for noncompliance, it makes it all the more important that the Commission provide additional time for the license term. Accordingly, the Commission's proposed 15-year license term appears reasonable.

C. UTC Supports Performance Requirements Based on Geographic Coverage.

The Commission invites comment on the metrics that it should use to measure a broadband licensee's compliance with performance requirements. [37] In response, UTC supports the adoption of performance requirements based solely on geographic coverage. As a practical matter, utilities and other private wireless licensees tend to deploy networks to cover both populated and unpopulated areas. Adopting performance requirements based purely on population coverage, as the Commission suggests, would be inconsistent with the likely use of

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[36] *Id.* at ¶59.

[37] *Id.* at ¶60.

the band by broadband licensees such as utilities. Accordingly, UTC supports performance requirements that are based on geographic coverage, rather than population coverage.

The Commission has proposed penalties for failure to meet performance requirements, which would reduce the license term to 13 years, if the broadband licensee fails to meet the initial benchmark and would revoke the broadband license entirely if the broadband licensee fails to meet the second benchmark. In the event that the license is revoked, the FCC is proposing that the spectrum would be returned for auction.[38]

In response, UTC conditionally supports the Commission's proposed penalties. UTC supports the penalties on the condition that the performance metrics are based on geographic coverage rather than population coverage, as recommended by UTC herein. Alternatively, UTC also supports the Commission's proposal to allow utilities to meet their performance requirements by demonstrating narrowband operations for Narrowband Internet of Things (NB-IoT).[39] In that regard, UTC emphasizes to the Commission that utilities will be using the spectrum for private systems, and the Commission should not require them to provide commercial broadband services to meet their performance requirements.

XII. UTC Supports Interference Criteria Based on Rules for 800 MHz Band and Generally Supports the Proposed Technical Rules for the Broadband Segment

UTC supports the Commission's proposal to use Power Spectral Density (PSD) to limit output power.[40] Specifically, UTC supports the proposal for an effective radiated power for base and repeater stations in the broadband segment not to exceed 400 watts/megahertz in non-rural

[38] *Id.* at ¶64.

[39] *Id.* at ¶63.

[40] *Id.* at ¶71.

areas and 800 watts/megahertz in rural areas, with the maximum permissible power decreasing as the HAAT rises above 304 meters. UTC also supports the Commission's proposal to adopt a median field strength limit of 40 dBμV/m at any given point along the geographic license area boundary in the broadband segment unless the affected licensee agrees to a higher field strength limit.[41] Finally, UTC supports using the same interference criteria in the 900 MHz band as the Commission has used in the 800 MHz band.

UTC submits that applying the interference criteria from the 800 MHz band here would be more appropriate because it more closely aligns with the interference environment and the configuration of the band that the Commission proposes through realignment of the 900 MHz band. That is to say, by separating the narrowband and broadband segments from each other in the 900 MHz band, the Commission should adopt the same interference criteria that it developed for the 800 MHz band after it was segmented into separate narrowband and broadband parts of the band.

XIII. UTC Supports Technical Rules to Protect Systems in the Narrowband Segment and Operations in the Adjacent Narrowband PCS Band.

UTC also supports the Commission's technical rules that are designed to protect against adjacent channel interference to Narrowband PCS operations (e.g. Sensus meters).[42] Specifically, UTC supports the Commission's proposal for a 500 kHz guard band, but is concerned that the FCC has not provided narrowband systems within the 900 MHz band with similar protection. Accordingly, UTC urges the Commission to develop innovative solutions that would provide just as much interference protection for narrowband systems within the 900

[41] *Id.*

[42] *Id.* at ¶74.

MHz band as it is proposing to provide for Narrowband PCS systems adjacent to the 900 MHz band.

UTC also supports the use of an adjacent channel interference metric using 43 + 10 log (P) dB for uplink operations in the 897.5-900.5 MHz band and by at least 50 + 10 log (p) dB for downlink operations in the 936.5-939.5 MHz band.[43] UTC believes that adjacent channel interference rules are necessary in addition to out-of-band emission limits to protect narrowband operations in the adjacent narrowband segments. This allows narrowband licensees to complain if they experience adjacent channel interference, notwithstanding compliance with the out of band emission limits.

Respectfully,

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[43] *Id.* at ¶76.