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

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183
	)	

COMMENTS OF THE UTILITIES TECHNOLOGY COUNCIL AND THE EDISON ELECTRIC INSTITUTE

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SUMMARY

UTC and EEI oppose expanded use of the 6 GHz bands for unlicensed and licensed broadband wireless fixed and mobile services. The bands are already heavily used by utilities for mission critical operations. UTC and EEI believe that the interference mitigation approaches that the FCC is considering would not be effective as a practical matter, particularly in the long term due to increases in the noise floor that would cause interference from the proliferation of unlicensed devices operating in the bands. Any benefit from the expansion of the bands would be outweighed by the threat of interference to utility mission critical communications in the bands.

UTC and EEI support expanding the use of the 4 GHz band by eliminating full-band, full-arc coordination of satellite earth stations. This spectrum could be put to effective use, and there is sufficient information that has already been submitted on the record to show that it is underused. Finally, UTC and EEI believe that the 4 GHz band can be effectively shared while at the same time protecting against interference. UTC and EEI believe that it is too early to rely on automated coordination, and that point-to-point operations must be protected from interference. Therefore, UTC and EEI support expanding the use of the 4 GHz band.

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Pursuant to sections 1.415 and 1.419 of the Federal Communications Commission's ("FCC" or "Commission") Rules, the Utilities Technology Council ("UTC") and the Edison Electric Institute ("EEI") hereby submit their comments in response to the Commission's Notice of Inquiry ("*NOI*") in the above-referenced proceeding.[1] As described more fully below, UTC and EEI oppose expanded use of the 5.925-6.425 GHz band ("Lower 6 GHz band") and the 6.425-7.125 GHz band ("Upper 6 GHz band") (collectively, the "6 GHz bands") because doing so would threaten to cause interference to the mission critical communications fixed microwave systems utilities use to support the safe, reliable and secure delivery of essential electric, gas and water services to the public at large. UTC and EEI support expanded use of the 3.7-4.2 GHz band (the "4 GHz band") to promote the use of this band for terrestrial fixed microwave operations for utilities.

I. Introduction

UTC is the international trade association for the telecommunications and information technology interests of electric, gas and water utilities and other critical infrastructure industries. Its members include all kinds of utilities, ranging in size from large investor-owned utilities that may serve millions of customers in multi-state service territories to smaller rural electric cooperative and public power utilities that may serve only a few thousand customers in remote areas or isolated communities. All of our

[1] *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017)(hereinafter "*NOI*").

member utilities have extensive private internal communications networks that they own, operate and maintain in order to ensure the safe, reliable and secure delivery of essential electric gas and water services to the public. These private internal communications networks are critical for protecting the safety and security of high energy critical assets, employees and the public. They also ensure operational reliability and compliance with regulatory requirements.[2]

EEI is the trade association that represents all U.S. investor-owned electric companies. EEI's members provide electricity for 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports over 7 million jobs in communities across the United States. In addition, EEI has more than 60 international electric companies, with operations in more than 90 countries, as International Members, and hundreds of industry suppliers and related organizations as Associate Members. Organized in 1933, EEI provides public policy leadership, strategic business intelligence, and essential conferences and forums. EEI's members are major users of telecommunications systems to support the goals of clean power, grid modernization, and promoting customer solutions. On behalf of the owners and operators of a significant portion of the U.S. electricity grid, EEI has filed comments before the Commission in various proceedings affecting the telecommunications' rights and obligations of its members who are impacted by the FCC's rules and policies.

A. 6 GHz Bands

UTC's and EEI's primary interest in the NOI is in preserving the 6 GHz bands for continued use by utilities and other critical infrastructure industries for microwave operations and protecting against interference and congestion that would likely result from expanding the use of the band for other unlicensed and licensed operations. There are more than 28,000 fixed microwave links in the Lower 6

[2] These regulatory requirements include, North American Electric Reliability Corporation (NERC) and Federal Energy Regulatory Commission requirements, as well as regional electricity coordinating council and state public service commission requirements, related to reliability and security.

GHz band and there are more than 23,000 fixed microwave links in the Upper 6 GHz band. Many of these are licensed to utilities. As more fully explained below, UTC's and EEI's interest in the 6 GHz bands is as follows:

- The 6 GHz bands are uniquely and perfectly suited to utilities' bandwidth needs for point-to-point microwave communications;
- Utilities are opposed to expanded use of these bands for licensed and unlicensed operations;
- Utilities support long term protection of the 6 GHz bands for utility and other mission critical communications.

Utilities, pipeline companies and other critical infrastructure industries use 6 GHz microwave systems to provide backhaul capacity to support voice and data communications in field area networks in their service territories for Supervisory Control and Data Acquisition (SCADA), protective relaying and smart grid applications, as more fully described below. Voice applications include nuclear emergency telecommunications systems and trunked radio systems. Data applications include all traffic that is processed on mainframes within utility communications networks, as well as a number of nuclear applications that must be available for the stations to remain in operation. Microwave systems run in parallel to private fiber networks to provide a completely redundant path between and among utility facilities for mission critical applications, many of which affect employee and public safety.

These microwave systems are the "workhorses" of utility communications networks and have been in operation for decades, providing highly reliable point-to-point, high capacity communications over extremely long distances cost effectively, securely, reliably, with predictability and determinism of circuit delays[3]. There are literally thousands of these systems in the 6 GHz bands that are licensed to utilities -- located in rural and urban areas throughout the country.

The critical nature of the traffic carried over these networks must be underscored. These microwave systems serve as the primary telecommunications backbone for utility networks, and carry numerous applications and services. Some of these applications and services are described below:

[3] Telecommunications company circuits are subject to unannounced circuit reroutes, which cause protection relay timing issues.

Protective relaying – Protective relaying is used to ensure utilities have dependable and secure protection for faults on the electrical system. Should there be intermittent interruptions there is increased risk that the protective relaying would not operate correctly. This could mean that either service is interrupted for non-faulted equipment or service is not interrupted for faulted equipment. It is critical that these protection systems are operated correctly for the safety of the public and stability of the electric system.[4]

Supervisory Control and Data Acquisition (SCADA) – SCADA systems remotely monitor and control operations on multiple devices throughout every aspect of utility operations. This system is important because it provides utilities with valuable data and capabilities that are key to delivering power in a safe and reliable manner. These SCADA systems have numerous end points being monitored, and each utility may have thousands of devices and hundreds of thousands of SCADA points in service. Quality communications to these devices and SCADA points is essential in day to day operations of all utility assets. As more smart grid applications are implemented by utilities, real time data provided by SCADA becomes even more significant.

Mobile Radio – The backhaul for utility mobile radio systems is carried through microwave systems. The mobile radios are used in line-stringing operations, outages, storm restoration, general verbal communications, and day-to-day operations. These systems provide coverage in rural and remote areas where cellular service is either unreliable or not even available. A fully functioning and operational mobile radio network is extremely important during emergency situations. It is during these times that commercial communications networks can become so saturated that they are unable to function, or go completely offline altogether.[5]

Voice Connections – Voice connections to transmission substations and communication sites are carried by microwave systems. These circuits provide another means for emergency communications at these remote locations. These links are vital for restoration efforts and at high voltage transmission substations and switching stations.

Load ("Demand") Management –Microwave networks carry backhaul for electric load management programs. These programs help balance the demand for electricity with the ability to generate and economically purchase electricity. Since, from a physics standpoint, electricity must be generated and consumed instantaneously, the importance

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[4] Substation and switching station transformers can be destroyed if system protection communications fails. These large transformers can cost more than $1 million each and are no longer available domestically. Replacements often take as long as six months to one year to obtain.

[5] During Hurricane Katrina commercial systems were out for days or weeks, whereas utility communications networks continued to operate or were restored in much less time. *See Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks: Report and Recommendations to the Federal Communications Commission* (June 12, 2006), *available at* https://transition.fcc.gov/pshs/docs/advisory/hkip/karrp.pdf (finding that "electric utility networks (including utility-owned commercial wireless networks) appeared to have a high rate of survivability following Katrina. These communications systems did not have a significant rate of failure because: (1) the systems were designed to remain intact to aid restoration of electric service following a significant storm event; (2) they were built with significant onsite back-up power supplies (batteries and generators); (3) last mile connections to tower sites and the backbone transport are typically owned by the utility and have redundant paths (both T1 and fixed microwave); and (4) the staff responsible for the communications network have a focus on continuing maintenance of network elements (for example, exercising standby generators on a routine basis).")

of maintaining this balance cannot be overemphasized. This management helps in critical planning, and also reduces the need for additional generation and reduces the need to purchase expensive power during periods of high demand. The amount of load that is reduced by these programs can be significant, equaling the output of a small power plant. Load management is energy conservation at work.

Public Safety Communications – utilities have excellent relationships with public safety entities and government agencies. They work cooperatively with public safety agencies and have mutual agreements for tower and building space. In some instances, utilities also provide circuits within their microwave networks for these public safety entities and government agencies. The importance of public safety communications cannot be overstated.

B. 4 GHz Band

UTC and EEI are also interested in promoting access for utilities to the 4 GHz band. As the Commission observes, the 4 GHz band is currently allocated for use by fixed satellite services (FSS) and broadcast satellite service (BSS), as well as terrestrial fixed services (FS). Currently, satellite earth stations are coordinated in such a way as to preclude the use of the 4 GHz band by terrestrial fixed services, as a practical matter. If the Commission eliminated full-band, full-arc coordination of satellite earth stations, it would open up the band for use by utilities and other terrestrial FS licensees. Expanded access to the 4 GHz band would provide capacity and coverage for utilities' increasing wireless communications needs. There is 500 MHz of spectrum available for use and the band is currently allocated in 20 MHz channels. In addition to providing capacity, the 4 GHz band has excellent propagation characteristics compared to high-band spectrum, offering near-line-of-sight ("NLOS") capability at low power for last-mile services. As such, this licensed mid-band spectrum could serve to support a variety of broadband communications applications. For years, UTC has advocated for eliminating full-band, full-arc coordination in the 4 GHz band in numerous comments and petitions that it has filed and signed onto as part of the Fixed Wireless Communications Coalition.[6]

[6] *See* Request for Declaratory Ruling and Petition for Rulemaking of the Fixed Wireless Communications Coalition, (filed May 5, 1999) (requesting the FCC to change the practice of routine full-band, full-arc licensing.). *See also* Reply Comments of the United Telecom Council in IB Docket No. 00-203 (filed Feb. 9, 2001)(supporting the FWCC Petition). *And see* FWCC Letter to FCC, Request for an Audit of Licensed Satellite Earth Stations in Bands Shared with the Terrestrial Fixed Service, Sept. 30, 2016 at 3. FWCC has requested an audit of FSS earth stations in June 2002, February 2004, November 2008, and September 2016. *See id*. at 1-2 and

II. The Commission Should Not Expand the Use of the 6 GHz Bands

In the NOI, the Commission invites comment on the potential for additional flexible wireless broadband use in the 5.925-6.425 GHz band, taking into consideration existing and future incumbent uses as well as compatibility with adjacent band services.[7] The Commission also invites comment on the potential for more intensive FS or mobile use of the 6.425-7.125 GHz band.[8] The Commission is specifically interested in whether it would be possible and technically beneficial for Unlicensed National Information Infrastructure (U-NII) devices in the 5.15-5.35 GHz and 5.47-5.725 GHz bands to operate in both the 6 GHz bands and the existing U-NII spectrum.[9] The Commission believes that this would allow the devices to operate with wider channel bandwidths and higher data rates as well as with increased flexibility for all types of unlicensed operations.[10]

Unlicensed devices would need to protect the licensed services that operate in the 6 GHz bands.[11] The Commission invites comment on whether it would be feasible for the Commission to adopt techniques to mitigate the risk of interference from unlicensed devices to licensed services in the 6 GHz bands.[12] Specifically, it asks if it could "limit the unlicensed devices to operate at a lower power than has traditionally been permitted by its rules, restrict the types of antennas permitted, limit the [Effective Isotropic Radiated Power] EIRP toward the geostationary arc, allow only indoor use, or require the devices to have a geo-location capability and means to access a database to determine whether they may

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[7] *NOI* at ¶25.

[8] *NOI* at ¶36.

[9] *NOI* at ¶¶25, 36.

[10] *Id*. at ¶25.

[11] *Id*.at ¶29.

[12] *Id*.

transmit."[13] The Commission also invites comment on whether it may be viable to realign or retune existing incumbent operations in these bands to make more efficient use of this spectrum and better facilitate sharing.[14]

Finally, the Commission considers whether the 6 GHz bands could be shared to support licensed wireless broadband. The Commission advises that any such use would need to coexist with licensed FS and FSS services, and it invites comment on how the band may coexist with existing services. The Commission also states that many of the same issues regarding sharing the 6 GHz bands with other licensed services would also apply in terms of sharing the 4 GHz band.[15]

At the outset, UTC and EEI emphasize that the 6 GHz bands are heavily used and that prior coordination techniques employed in these bands make highly efficient use of the spectrum. Terrestrial FS antennas are fixed and highly directional, such that links can successfully operate on the same frequency even in close proximity with each other, so long as they do not both impinge on the same receive antenna from the same direction (or from different directions at overly high power). The bands are being used efficiently already, and this process of prior coordination that protects against interference makes it all work and must be preserved going forward – particularly given the importance of the mission critical communications that are being carried over the fixed microwave systems in the band.

UTC and EEI are concerned that the expanded use of the 6 GHz bands for either unlicensed or licensed purposes would cause interference to incumbent fixed microwave systems. As noted above, these microwave systems are used for mission critical communications and therefore must maintain extremely high standards for reliability.[16] Most links in the band are designed for availabilities of 99.999

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[13] *Id*.

[14] *Id*.

[15] *Id*. at 31.

[16] For example, IEEE_C37_1-2007 Section 5.1, establishes the typical utility SCADA systems reliability requirements. The most stringent 'Unavailability' requirement is applied when all SCADA data go through the same message structure/system. It is 1 hour/month unavailable. This equates to a system performance of 99.86 percent available, which means the transport needs to be a fraction of the unavailability. To support this number, transport should be around 99.99 percent or better.

percent or better; some operate at 99.9999 percent.[17] They cannot risk interference, and interference is likely to result from expanded use of the band by new entrants, as more fully explained below.

Utilities lack alternatives to operating in the 6 GHz bands. Many of the utilities that are licensed in the 6 GHz bands were forced by the FCC to relocate from the 2 GHz band. They have nowhere else to relocate because the 6 GHz bands are the only option that provides the propagation utilities need to communicate over long distances from point to point. While utilities have licensed microwave systems in the 8 and 11 GHz bands, those bands are not as well suited for long distance communications and are more subject to line-of-sight issues. A 6 GHz microwave link typically extends 25 miles, but a 11 GHz link would only provide reliable communications at a distance of about 15 miles.[18] Therefore, transitioning systems from 6 GHz to higher bands would necessarily require redesigning the network and constructing additional links. It would not be a relatively simple matter of changing out the equipment on the towers, and it may be even more difficult if there are no available sites to bridge the gap between links to make the connection using an 8 or 11 GHz system.

In addition, in order to support increasing demand from smart grid and other applications, utilities need to be able to expand capacity in the 6 GHz bands by using wider channels. Utilities are concerned that congestion and interference from new entrants would make it more difficult for utilities to increase the capacity of their existing systems.[19] Utilities will need to increase channel widths for their existing systems to 30 MHz, 40 MHz or even 60 MHz channels. This trend is already underway and expected to increase as utilities need to boost the capacity of their communications systems. Equipment is commercially available to support these wider channels, which also is an indication that licensees in the 6

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[17] Availability of 99.999 percent means all outages from all causes combined total no more than 5.3 minutes per year; 99.9999 percent reliability means total outages of no more than 32 *seconds* per year.

[18] Note that terrain and trees can also affect the design criteria for the distance of a microwave link, and utilities may need to design their microwave networks with shorter links in order to maintain reliability standards.

[19] Applications driving demand for increased capacity and reliability include substation data, public safety requirements, and compliance with NERC critical infrastructure protection reliability requirements for substations. This will become even more important as utility regional Reliability Coordinators begin to require that utilities send phasor measurement units (PMU) data back to the coordinators.

GHz bands are expanding capacity generally. As such, the Commission should not expand the use of the 6 GHz bands because it would prevent utilities and other incumbents in the 6 GHz bands from increasing capacity using wider channels.

In some cases, utilities have resorted to using unlicensed solutions in the 2.4 and 5.8 GHz bands, but interference in these bands renders them unreliable for mission critical operations. Specifically, utilities report that on 2.4 GHz unlicensed microwave systems, they are experiencing outages from 10 minutes up to four hours, restricting the use of their transmission SCADA networks and their protective relaying for critical operational systems. Due to increasing outages, utilities are replacing their 2.4 GHz microwave links with 6 GHz systems. Also, dynamic frequency selection has been employed, but utilities often cannot find any open frequency pairs to operate on without interference.[20] Interference is also affecting utility 5.8 GHz unlicensed systems that support transmission SCADA, protective relaying, and shared systems for public safety state radio communications -- including 911 communications.[21] All three of these systems are critical operational electrical systems or public safety critical systems. Again, these problems with unlicensed 2.4 GHz and 5.8 GHz systems underscore the absence of reasonable alternatives for utilities to continue to use the 6 GHz bands.

It is also important for the Commission to recognize that utilities have made significant investments in their 6 GHz communications systems. Significant stranded investment would result if utilities were forced out of the 6 GHz bands, due to interference from new unlicensed and licensed operations entering the bands. As noted above, utilities would incur significant additional capital and operational expenses if they had to migrate off their 6 GHz systems and use other microwave bands at higher frequencies. Even if they did not have to migrate out of 6 GHz, they would at least need to densify

[20] Utilities report that interference is so bad that outages can last up to four hours before the system will find frequencies that become clear on which to operate. These are rural microwave hops, not in heavily populated areas.

[21] The outages are shorter in duration than at 2.4 GHz but still make the systems unusable during times of interference. Utilities report that they will be forced to move off these unlicensed 5.8 GHz systems to migrate onto licensed 6 GHz systems, as well.

their microwave networks by reducing the distance of their links to maintain their standards for communications reliability to offset the effects of interference from new entrants in the band, should the Commission expand the use of the 6 GHz bands.[22] It is also important to note that additional links would also introduce latency, which is a critical performance issue for these microwave systems. Clearly, it is not just a question of cost, but also a matter of performance.[23]

Most importantly, the public interest would not be served because any marginal benefit that might be gained by expanded use of the 6 GHz bands would be outweighed by the potential for interference to utility mission critical communications. UTC and EEI emphasize that these microwave systems are used by a variety of entities besides utilities, including public safety providers, railroads, pipeline companies, and commercial communications service providers. The public relies on the services these entities provide – as demonstrated time and again during restoration activities after major storms -- and any interference to these entities' microwave systems could prevent the delivery of essential services to the public, including the most fundamental services such as electricity, heat and water. Worse, interference from expanded use of the band by new entrants could threaten the safety of life, health and property, if first responders cannot communicate, if 911 services are affected, if utility protective relay systems fail to operate, or gas or water valves malfunction. Therefore, whatever marginal benefit that might be gained by expanding uses of the 6 GHz bands would be outweighed by the risk to the essential services that are provided over incumbent microwave systems within the bands.

The public interest is served by protecting utility communications and indeed promoting opportunities for utility communications systems to grow.[24] Utilities lack access to sufficient spectrum to

[22] Changing from existing fixed microwave systems will require extensive hardening of networks to achieve same end-to-end reliability standards, as more network elements will need to be introduced.

[23] Utilities had to redesign many protection schemes and redesign their telecommunications systems in mid-1990s when Personal Communications Service (PCS) took over many of utilities' 2.4 GHz fixed microwave systems.

[24] Utilities should be assigned spectrum which they can rely on for an extended time, and not have to redesign their protection and communication systems every several decades. Utility and energy delivery systems (pipes and wires) are stable, long-term infrastructure which hardly change in a century; their control and protection systems should not be subject to disruptive changes (which can introduce instabilities).

meet their increasing communications needs, whether it is microwave spectrum or land mobile spectrum for private networks. They need additional capacity and coverage for expansion of smart grid technologies and other utility applications. Therefore, the Commission should look for opportunities to provide utilities with additional licensed spectrum, and it should not be reallocating existing utility spectrum bands – or as here -- considering expanding the use of existing utility spectrum bands by other entities. Doing so will only compound the current spectrum crisis that continues to threaten the reliability of utility operations, preventing them from increasing capacity to support increasing communications needs, due to increased cybersecurity requirements and a host of new utility-supported applications, ranging from smarter grids to smarter cities.

Conversely, the public interest is not served by increasing congestion and interference in existing utility spectrum bands. A perfect example of where the Commission's policies have threatened to cause interference and congestion in existing utility spectrum is the recent decision to grant an application and a waiver to Higher Ground to operate 50,000 mobile earth terminals in the Lower 6 GHz band. [25] UTC and EEI take this opportunity to reiterate their opposition to this decision.[26] UTC and EEI are also concerned that the instant NOI would exacerbate the potential for interference and congestion by permitting additional fixed and mobile unlicensed or licensed operations in the 6 GHz bands. As such, UTC and EEI emphasize that the Commission should prevent Higher Ground and any other expanded uses of the 6 GHz bands from interfering with microwave communications systems by utilities, public safety and other critical infrastructure industries.

Turning to the specific questions raised by the Commission in the context of potential ways of

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[25] In the Matter of Higher Ground LLC, *Order and Authorization*, IBFS File No.: SES-LIC-20150616-00357, DA 17-80 (rel. Jan. 18, 2017)(hereinafter "*Order*"). *See also*, Higher Ground Application for a Blanket License to Operate C-band Mobile Earth Terminals, IBFS File No. SES-LIC-20150616-00357 (Application and Waiver).

[25] 47 CFR §§ 25.130(b), 25.203(c), and 101.103.

[26] *See* Application for Review of the Utilities Technology Council, IBFS File No.: SES-LIC-20150616-00357 (filed Feb. 17, 2017). *See also* Application for Review of the Fixed Wireless Communications Coalition (filed Feb. 10, 2017); APCO International (filed Feb. 17, 2017); and Enterprise Wireless Alliance, IBFS File No.: SES-LIC-20150616-00357 (filed Feb. 17, 2017).

mitigating interference to incumbent licensed systems in the 6 GHz bands, UTC and EEI do not believe that it would be technically feasible or effective in the long-term to implement the interference mitigation approaches identified by the FCC. Specifically, reducing power below what has traditionally been permitted and restricting the types of antennas that are permitted are likely going to only diminish the effectiveness of any outdoor operations and thereby discourage new entrants using unlicensed technologies. Similarly, geo-location capability will likely be cost-prohibitive if it relies on sensing technologies, and alternatively if it relies on coordination through a database, it will need to be thoroughly tested before it should be authorized. Restricting operations to indoor use may be the only option that would protect incumbent FS operations, but again, it is not clear that such restrictions would attract new entrants to operate in the bands.

The main concern that UTC and EEI have about all of these approaches is that they cannot guarantee that the noise floor will not rise from the aggregated operation of countless unlicensed devices. This has been the case in other unlicensed bands, and it is reasonable to assume it would occur in the 6 GHz bands if the bands were expanded to permit widespread unlicensed operations. In any event, UTC and EEI are opposed to an approach that would compromise the prior coordination process, which has proven to be effective at preventing interference. In that regard, UTC and EEI also oppose any approach that would rely on *post hoc* interference mitigation. Due to the critical nature of the communications carried over utility fixed microwave systems, interference must be prevented *a priori*. Finally, UTC and EEI are opposed to any retuning of the bands, which would be virtually impossible considering the numerous microwave paths that are involved and the extent to which they are carefully coordinated with each other prior to even applying for a license from the FCC. Realigning these systems would be tantamount to a game of spectrum Jenga that should never be played with mission critical communications.

III. The Commission Should Eliminate Full-Band, Full-Arc Coordination of Satellite Earth Stations in the 4 GHz Band.

In the NOI, the Commission seeks comment, generally, on the potential for more intensive use of

the 3.7-4.2 GHz band for wireless broadband. In that regard, the Commission asks commenting parties to address how existing service rules governing GSO FSS and FS could be modified to further promote flexible use in this band, stimulate investment, and encourage more intensive deployment in the 3.7-4.2 GHz band for wireless broadband.[27] Specifically, the FCC invites comment on a petition that was filed by the Fixed Wireless Communications Coalition (FWCC) in 2016, which proposed that the FCC modify the current full-band, full-arc process for the coordination of FSS and FS stations in the 3.7-4.2 GHz band.[28] UTC is part of the FWCC and agrees that the current procedures are spectrally inefficient because new or modified FS links are not allowed to use fallow spectrum in the band even if there would be no harmful interference to any existing Earth-station operations. As the Commission also notes, the Broadband Access Coalition filed a similar petition more recently, and UTC filed comments in support of that petition which also proposes to eliminate full-band, full-arc coordination of satellite earth stations.[29]

UTC and EEI take this opportunity to reiterate their support for eliminating the policy of coordinating satellite earth stations so that no terrestrial FS station can be licensed anywhere within the entire geostationary arc of the antenna of a satellite earth station and on any frequency in the entire 500 MHz of spectrum in the 4 GHz band. This policy, originated in the 1960s, is outdated, particularly given that the C-band (i.e. the 4 GHz band) is relatively unused now compared to its heyday in the 1980s.[30]

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[27] *NOI* at ¶16.

[28] *Fixed Wireless Communications Coalition Inc., Request for Modified Coordination Procedures in Bands Shared Between the Fixed Service and the Fixed Satellite Service*, RM 11778, Petition for Rulemaking (Oct. 11, 2016) (FWCC Petition).

[29] *Petition of Broadband Access Coalition for a Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3700-4200 MHz Band*, RM-11791, Public Notice, Consumer and Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed, Report No. 3080 (CGB, July 7, 2017) (BAC Petition).

[30] Commissioner Michael O'Reilly, "A Mid-Band Spectrum Win in the Making," visited at https://www.fcc.gov/news-events/blog/2017/07/10/mid-band-spectrum-win-making (stating, "Gone are the days when hundreds of thousands of six-foot dishes (affectionately referred to as large bird baths) dotted the landscape, serving residents with video services. Subscribers have replaced these dishes with smaller ones (e.g., Dish and DIRECTV) or broadband services delivered via wireless or wireline networks.")

Not only is this spectrum being left fallow, there are utilities that would be very interested in making effective use of this spectrum if it was available. While satellite industry participants and organizations have opposed the elimination of full-band, full-arc, they fail to demonstrate that modifying it would result in interference. They also fail to counter evidence showing that the band is underutilized.[31] UTC and EEI note that there is little incentive for satellite earth station licensees to update the Commission's records, and the 15-year licensing period also contributes to the problem of outdated and inaccurate information in the Universal Licensing System (ULS) database. As such, UTC and EEI support eliminating the full-band, full-arc policy of coordinating satellite earth stations, and it urges the Commission to ensure that FSS licensees update the information in the ULS database.

IV. Conclusion

For all of these reasons, UTC and EEI oppose expanded use of the 6 GHz bands for unlicensed and licensed broadband wireless fixed and mobile services. The band is already heavily used by utilities for mission critical operations. UTC and EEI believe that the interference mitigation approaches that the FCC is considering would not be effective as a practical matter, particularly in the long term due to increases in the noise floor that would cause interference from the proliferation of unlicensed devices operating in the band. Any benefit from the expansion of the bands would be outweighed by the threat of interference to utility mission critical communications in the bands.

[31] BAC Petition at 23, *citing* FWCC Letter to FCC, Request for an Audit of Licensed Satellite Earth Stations in Bands Shared with the Terrestrial Fixed Service, Sept. 30, 2016 at 3 (finding that 27 percent of registered earth stations were never built or were subsequently decommissioned, and another 37.7 percent of earth stations were located more than 100 feet from their licensed coordinates.)

UTC and EEI support expanding the use of the 4 GHz band by eliminating full-band, full-arc coordination of satellite earth stations. This spectrum could be put to effective use, and there is sufficient information that has already been submitted on the record to show that it is underused. Finally, UTC and EEI believe that the 4 GHz band can be effectively shared while at the same time protecting against interference. UTC and EEI believe that it is too early to rely on automated coordination, and that point-to-point operations must be protected from interference. Therefore, UTC and EEI support expanding the use of the 4 GHz band.

Respectfully,

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