

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

In the Matter of)
)
Amendment of Part 90 of the Commission’s) WP Docket No. 07-100
Rules)

**COMMENTS OF THE UTILITIES TECHNOLOGY COUNCIL, THE EDISON
ELECTRIC INSTITUTE, THE NATIONAL RURAL ELECTRIC COOPERATIVE
ASSOCIATION AND THE GRIDWISE ALLIANCE**

The Utilities Technology Council (“UTC”), the Edison Electric Institute (“EEI”), the National Rural Electric Cooperative Association (“NRECA”) and the GridWise Alliance (“GridWise”) hereby submit the following comments in response to the Commission’s Sixth Further Notice of Proposed Rulemaking in the above-referenced proceeding.¹ UTC, EEI, NRECA, and GridWise urge the Commission to expand eligibility in the 4.9 GHz band to include utilities and other critical infrastructure industries (CII), as defined within the Commission’s rules.² UTC, EEI, NRECA, and GridWise support the band plan submitted by the National Public Safety Telecommunications Council (NPSTC Band Plan), which recommends that the Commission expand eligibility to include utilities and other CII.³ UTC, EEI, NRECA, and GridWise submit that expanding eligibility to include utilities and other CII will promote

¹ *Amendment of Part 90 of the Commission’s Rules*, Sixth Further Notice of Proposed Rulemaking, WP Docket No. 07-100, 83 Fed. Reg. 20011 (2018).

² *See* 47 C.F.R. §90.7 (defining critical infrastructure industries as “State, 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.”)

³ NPSTC 4.9 GHz NPSTC Plan Recommendations Final Report, WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150, at 10-11 (dated Oct. 24, 2013) (NPSTC Band Plan).

more effective use of the band, and will also serve the public interest in promoting the safe, reliable, and secure delivery of essential electric, gas and water services. This proceeding comes at a critical time in the history of the utility industry, and the FNPRM represents a significant opportunity for the Commission to advance energy policy and overarching national security goals by providing access to spectrum for utilities and other CII.

As has been reported in numerous proceedings before the Commission, utilities across the country urgently need access to the 4.9 GHz band to support increased bandwidth requirements for applications such as remote monitoring and control of transmission and distribution substations as well as distribution automation (DA) and synchrophasor technologies which provide power quality monitoring to improve the efficiency and reliability of electric services.⁴ Moreover, if the Commission expands eligibility to include CII, utilities would likely invest in deploying communications networks in the 4.9 GHz band immediately over the next five years to support utility applications with high capacity and high duty cycle requirements.

Utilities and other CII lack access to additional spectrum to meet their increasing communications needs, and the existing spectrum bands these entities use are subject to increasing congestion and interference – and potential wholesale reallocation – due to other communications which are incompatible with utility operations. By comparison, sharing the 4.9

⁴ See e.g. Comments of the Utilities Technology Council in GN Docket No. 17-258 (filed Dec. 28, 2017)(requesting access to the 3.5 GHz band to support utilities increasing needs for coverage and capacity, due to increasing demand for communications to support smart grid as well as cyber security and physical security regulatory requirements). See also Comments of the Utilities Technology Council and the Edison Electric Institute in GN Docket No. 17-183 (filed Oct. 2, 2017)(explaining that utilities rely on the 6 GHz band for mission-critical communications and need to expand capacity of their systems in the band to meet increasing communications needs). And see Letter from Phillip Moeller, Executive Vice President, Business Operations Group and Regulatory Affairs, Edison Electric Institute to Marlene H. Dortch, Secretary, Federal Communications Commission in GN Docket No. 17-258 (filed June 5, 2018)(explaining that utilities invest \$100 billion annually in smart grid, and they currently operate systems and need to expand capacity in the 3.5 GHz band to support smart grid.)

GHz band between utilities and public safety would be complementary and promote synergies that the Commission recognized as part of its National Broadband Plan. Utility use of the band would support public safety, particularly in the aftermath of hurricanes and other natural disasters when restoration of electric, gas and water services is necessary to protect the health and safety of the public at large and to enable police, fire and rescue to perform their public safety missions.

UTC, EEI, NRECA, and GridWise agree with public safety that the Commission should not convert the 4.9 GHz band for use by commercial communications service providers because doing so would threaten to diminish the reliability of the band, which would in turn discourage investment by utilities and public safety and indeed effectively displace them from the band as a practical matter. Moreover, UTC, EEI, NRECA, and GridWise submit that other bands are better suited for use by commercial communications service providers. Sharing the 4.9 GHz band with utilities and other CII would be relatively simple compared with sharing it with commercial communications service providers, which would require much more complex sharing mechanisms that would prove counterproductive to the goal of putting the 4.9 GHz band to effective use in the near term.

UTC, EEI, NRECA, and GridWise emphasize that while we support utility access to the 4.9 GHz band, the Commission should not tradeoff the 4.9 GHz band for utility access to other existing or future bands. To be sure, utilities need access to additional spectrum and although the 4.9 GHz band will help, it will not meet all of utility additional spectrum requirements, nor could it substitute for continued access to existing spectrum bands. In this respect, UTC, EEI, NRECA, and GridWise reiterate that the Commission should not reallocate or expand the 6 GHz band for commercial services or unlicensed operations. As UTC, and others have explained in

other pending proceedings, the 6 GHz band is home to thousands of microwave systems, including many that are used by utilities to carry mission critical communications that cannot risk the potential of interference from the introduction of unlicensed operations or that would need to be relocated if the 6 GHz band were reallocated for commercial services. The 6 GHz band must be preserved to ensure communications reliability for utilities and other CII, as well as public safety and other important incumbent operations in the band. Therefore, the 4.9 GHz is not and should not be considered by the Commission as a substitute for continued interference-free access to the 6 GHz band by utilities and other incumbent critical infrastructure microwave operations.

Finally, UTC, EEI, NRECA, and GridWise support several of the technical proposals in the further rulemaking that are designed to increase the potential use of the 4.9 GHz band. Specifically, UTC, EEI, NRECA, and GridWise support the Commission's proposals to increase the size of the channels and the permissible power of operations in the band, which will enable utilities and others to use the band for longer links and higher capacity communications, particularly in rural areas where the 4.9 GHz band is currently underused and utilities need to use it to communicate with critical assets.

I. Introduction

UTC is the international trade association advocating for the telecommunications and information technology interests of utilities and other critical infrastructure industries. Its members own, manage and control extensive communications networks that they use to support the safe, reliable and efficient delivery of essential electric, gas and water services to the public at large. These members include large investor-owned utilities that may serve millions of customers across multi-state service territories, as well as smaller rural electric cooperative

utilities or municipal utilities that serve only a few thousand customers in isolated communities or remote regions of the country.

EEI is the trade organization 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. The electric power industry supports over seven million jobs in communities across the United States. As providers of electricity to much of America, EEI's members are major users of wireless telecommunications systems that operate to support the provision of safe, reliable, and low-cost power to the public and to ensure safety of life, property and the environment. With the modernization of the electric grid, clean power initiatives and innovative customer solutions technologies, electric companies face increasing needs for access to licensed spectrum. Accordingly, EEI members have a strong interest in ensuring the Commission's proposals for 4.9 GHz band properly consider the broader questions at issue and the implications of various options before it, especially as they impact critical infrastructure industry entities such as electric companies.

NRECA is the national service organization for more than 900 not-for-profit rural electric utilities that provide electric energy to approximately 42 million people in 47 states. Rural electric cooperatives are private, non-profit entities that are owned and governed by the members to whom they deliver electricity. They serve 56 percent of the nation, 88 percent of all counties, and 12 percent of the nation's electric customers, while accounting for approximately 13 percent of all electric energy sold in the United States. Rural electric cooperatives serve the vast majority of the nation's persistent poverty counties (330 out of 353, or 93 percent). In all, about 15.5 percent of the 42 million Americans served by electric cooperatives live below the poverty line.

The GridWise Alliance consists of electric utilities (investor owned, municipal, and rural electric cooperatives), information and communications technology equipment and service providers, national laboratories, Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs), and academic institutions.⁵ Its members represent the ecosystem of stakeholders involved in the modernization of the electric grid, for whom these communications and spectrum access issues are vitally important.

Utilities and other critical infrastructure industry entities are undertaking smart grid and other applications that require additional communications capabilities. Utility Information and Communications Technology (ICT) networks need increased capacity and coverage to support greater visibility into the critical infrastructure owned and operated by these entities. For some applications, latency needs to be exceptionally low. Moreover, reliability and resiliency of the network needs to be exceptionally high, so that communications are maintained, especially during emergencies such as power outages.⁶

In order to meet their increasing communications demands, utilities and CII need access to additional spectrum supporting the capacity, coverage, and other requirements that utilities

⁵ GridWise's RTO/ISO and national laboratory members and the Bonneville Power Administration (BPA) do not participate in advocacy activities, so these comments do not represent the views of these GridWise members.

⁶ For example, the North American Electric Reliability Corporation (NERC) develops reliability standards that are enforced by the Federal Energy Regulatory Commission (FERC), and these standards are contributing to the need for greater visibility to monitor and control critical assets such as substations to protect against physical and cybersecurity threats. *See* NERC Reliability Standards, *available at* <https://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx>. In addition, state and federal smart grid implementation policies are also driving the need for more robust communications capabilities deeper into utility infrastructure to support a growing number of intelligent electronic devices and different types of applications that are designed to improve the quality, reliability, safety and security of utility electric, gas and water services. *See e.g.* "Communications Requirements of Smart Grid Technologies," Department of Energy (Oct, 10, 2010), *available at* <https://www.energy.gov/gc/downloads/communications-requirements-smart-grid-technologies>. *See also* "Smart Grid Communications Networks", National Institute of Standards and Technology (NIST), *available at* <https://www.nist.gov/programs-projects/smart-grid-communication-networks>.

and CII must meet. Utilities do not currently have access to suitable spectrum to meet the demands from smart grid and other applications. The land-mobile spectrum utilities currently use is narrowband and subject to interference and congestion. Microwave spectrum has been reallocated for commercial services and utilities and CII have been relocated to higher frequency bands. Unlicensed spectrum is subject to power limitations and interference, reducing its coverage and reliability. Hence, utilities and CII need access to spectrum that provides the capability for wideband fixed and mobile applications to provide additional wide-area coverage and backhaul.

UTC has been an active participant in this proceeding and has supported the Commission's proposals to expand eligibility to include critical infrastructure industry (CII) in the 4.9 GHz band. UTC filed comments and reply comments in 2012 in support of the Commission's proposal in the Fifth Further Notice of Proposed Rulemaking to expand eligibility to include utilities and other CII.⁷ At that time, UTC surveyed its members to determine how they intended to use the 4.9 GHz band, with most utilities reporting they would use it for communications backhaul and supervisory control and data acquisition (SCADA) applications. In addition to those applications, all utilities that responded to the survey reported that they would use the band to a lesser degree for advanced metering infrastructure (AMI), management of distributed generation, protective relaying, telemetry, video surveillance, and mobile data applications.

⁷ Comments of the Utilities Telecom Council in WP Docket No. 07-100 (filed Nov. 1, 2012)(hereinafter "UTC Comments on Fifth FNPRM"). *See also* Reply Comments of the Utilities Telecom Council in WP Docket No. 07-100 (filed Nov. 30, 2012)(hereinafter "UTC, EEI, NRECA, and GridWise Reply Comments on Fifth FNPRM"). *See also* Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking, 27 FCC Rcd 6577 (2012) (*Fifth Further Notice of Proposed Rulemaking or Fifth FNPRM*).

About half of the utilities responding to the survey reported that they would use the band within the next two years. Utilities explained that the 4.9 GHz band is attractive because it would provide broadband capacity, point-to-multipoint connectivity, and ease of deployment. In addition, utilities cited other benefits including using the band to support neighborhood area networks, wireless hot spots, temporary fixed use at emergencies, permanent fixed use for smart grid, and mobile data applications. On the downside, utilities cited limited coverage, equipment availability, secondary use restrictions, and general uncertainty surrounding utility access to the band as drawbacks for using it. Accordingly, UTC recommended eliminating secondary use restrictions on non-broadband use of the band, and it also supported increasing the output power to at least 63 dBm for point-to-point operations and 53 dBm for point-to-multipoint operations, as well as allowing 30 MHz wide channels as a means to increase reliability and capacity for utility applications.⁸ UTC also observed that there was widespread support on the record for expanding eligibility to include utilities and other CII, while there was significant opposition – particularly among public safety entities – for expanding eligibility more broadly to include commercial communications service providers.⁹

In 2013, UTC filed comments and reply comments in support of the NPSTC Band Plan.¹⁰ Specifically, UTC agreed with the finding in the NPSTC Band Plan that “CII plays a vital role in incident response to protect life and property, [and that] this 4.9 GHz band could enhance the

⁸ See Comments of UTC on Fifth FNPRM at 6-13.

⁹ See Reply Comments of UTC on Fifth FNPRM at 2, *citing* Comments of Cambium Networks, Ltd. at 5-6 (filed Oct. 1, 2012); Comments of Enterprise Wireless Association at 4 (filed Nov. 1, 2012); Comments of Great River Energy at 12 (filed Nov. 1, 2012); Comments of Motorola Solutions, Inc. at 4-5 (filed Nov. 1, 2012); Comments of FCCA, IAFC and IMSA at iii and 14 (filed Nov. 1, 2012); Comments of NPSTC at 8-9 (filed Nov. 1, 2012).

¹⁰ See Comments of UTC in WP Docket No. 07-100 (filed Nov. 22, 2013)(hereinafter “UTC Comments on the NPSTC Band Plan.”) See also Reply Comments of UTC in WP Docket No. 07-100 (filed Dec. 13, 2013)(hereinafter “UTC Reply Comments on the NPSTC Band Plan”).

delivery of public safety services by CII.”¹¹ Moreover, UTC supported the NPSTC Band Plan because it recommended that CII entities be made eligible on a co-primary basis with public safety agencies to license spectrum in the band. UTC also observed that there were numerous comments on the record that supported the recommendations in NPSTC Band Plan to make eligible CII as defined at Section 90.7 of the Commission’s rules, and to allow for CII access on a co-primary basis with public safety.¹² Finally, UTC supported the technical recommendations within the NPSTC Band Plan to promote the use of the band for fixed operations, including the recommendation to allow the aggregation of channels wider than 10 MHz, particularly in rural areas, and the recommendation to make Channels 14 through 18 available for point-to-point use as 1 MHz bandwidth channels to support narrowband backhaul on a primary basis.¹³

UTC, EEI, NRECA, and GridWise applaud the Commission for issuing its Sixth Further Notice of Proposed Rulemaking and support expanding eligibility to include utilities and other CII as well as other revisions to the rules that will promote more effective use of the 4.9 GHz band. As described more fully below, UTC, EEI, NRECA, and GridWise submit that expanding eligibility to include utilities and CII will promote more effective use of the 4.9 GHz band. Utilities urgently need access to additional capacity for fixed and mobile operations to support the proliferation of sensors and other devices for machine-to-machine (M2M) utility

¹¹ UTC Comments on the NPSTC Band Plan at 3, *citing* National Public Safety Telecommunications Council’s 4.9 GHz National Plan Recommendations Final Report at 10.

¹² *See* Reply Comments of UTC on the NPSTC Band Plan at 2, *citing* Reply Comments of Visilink in WP Docket No. 07-100 et al at 1 (filed Dec. 12, 2013); Comments of the American Petroleum Institute at 3 (filed Nov. 22, 2013)(stating that “API believes that it represents a generally acceptable compromise.”); and Comments of the Enterprise Wireless Association at 3 (filed Nov. 22, 2013)(stating that “The Alliance supports most of the Report’s recommendations with regard to [CII]”). *See also Id.*, *citing* Joint Comments of the Forestry Conservation Communications Association (FCCA), the International Municipal Signal Association (IMSA), and the International Association of Fire Chiefs (IAFC) in WP Docket No. 07-100 at 3 (filed Nov. 25, 2013).

¹³ *See* Comments of UTC on NPSTC Band Plan at 3-4.

applications, such as SCADA, DA, and AMI, as well as synchrophasors and other cutting-edge applications that will increase the safety, reliability and security of energy and water services. UTC, EEI, NRECA, and GridWise believe that the Commission should not expand eligibility more broadly to include commercial service providers, which would threaten to cause interference and congestion, thus effectively discouraging investment by utilities and displacing public safety incumbents in the band. Therefore, UTC, EEI, NRECA, and GridWise are pleased to file these comments in support of the Commission’s Sixth Further Notice of Proposed Rulemaking regarding the 4.9 GHz band.

II. The Commission Should Expand Eligibility to Include Utilities and CII to Make More Effective Use of the 4.9 GHz Band.

A. Introduction

The Commission requests comment on three different ways to increase the effective use of the band through expanding eligibility, shared use and other alternatives.¹⁴ First, the Commission invites comment on whether offering CII co-primary status with public safety is likely to create incentives for increased investment in the 4.9 GHz band.¹⁵ In that regard, the Commission believes that “[e]xtending eligibility to CII could encourage collaborative investment by public safety and CII users of the 4.9 GHz band to improve response to emergencies that affect both public safety and critical infrastructure.”¹⁶ Moreover, the Commission invites comment on whether CII access should be conditioned on using the band to provide “public safety services” as that term is defined in Section 337(f)(1)(A) of the

¹⁴ *Id.* at ¶¶64-86.

¹⁵ *Id.* at ¶70.

¹⁶ *Id.*

Communications Act of 1934, as amended.¹⁷ In that regard, the Commission believes that “there is sufficient remaining spectrum in the band to accommodate both expanded use by public safety and CII co-primary use[; and that] [s]tated otherwise, we think the benefits of co-primary use of the band by both CII and public safety can be realized at slight or no cost to public safety.”¹⁸

Alternatively, the Commission asks for comment whether to afford public safety priority over other users and how priority would be achieved.¹⁹ The Commission also asks for comment on the NPSTC Band Plan recommendation to provide CII immediate, co-primary access to Channels 6 and 7 during the first three years, to establish a notice procedure for CII access to the remainder of the band during the three-year period, and to open up the entire band to CII thereafter.²⁰ More specifically, the Commission invites comment on alternative arrangements, such as providing CII immediate access to Channels 12 and 13, which could be coupled with access to narrowband Channels 14-18 to create 15 megahertz of contiguous spectrum for CII to access on a co-primary basis.²¹ On a related note, the Commission asks whether it should exclude Channels 1-5 from CII eligibility in light of the Commission’s proposal to dedicate this segment to public safety aeronautical mobile and robotic use.²² Lastly, the Commission asks whether to expand eligibility to other entities besides those defined as CII under the Commission’s rules at Section 90.7. In this regard, the Commission invites comment on how a

¹⁷ *Id.* at ¶71.

¹⁸ *Id.*

¹⁹ *Id.* at ¶71.

²⁰ *Id.* at ¶72

²¹ *Id.*

²² *Id.*

set aside for CII would be consistent with the Commission's flexible licensing approach in other bands, and how CII entities' need for co-primary use of this band can be differentiated from the needs of other critical and safety-related industries that may seek access to this band in the future.²³

The Commission also invites comment on either leasing the spectrum or adopting two-tiered sharing on a secondary basis as alternative approaches for making more effective use of the band.²⁴ In the context of leasing, the Commission invites comments on the costs and benefits of such an approach, including the potential impact that leasing could have considering the use of the band for public safety services and the state of technology that could interrupt non-public safety use of the band during emergencies. Moreover, the Commission invites comment on the relative costs and benefits of a commercial-leasing options vis-à-vis the CII co-primary option that the Commission is also considering, including whether and to what degree either option would bring the greatest innovation to the 4.9 GHz band and which one would best facilitate the introduction of new, lower cost equipment.²⁵ Overall, the Commission invites comment on which option would best serve the goal of increasing shared use of this band at the lowest cost.²⁶ Meanwhile in the context of the two-tier sharing approach, the Commission invites comment on the feasibility and the costs and benefits of implementing a database solution to prioritize public safety and non-public safety tier operations. Specifically, what is the state of the technology for managing operations via a sharing database, and would the costs of implementing this solution

²³ *Id.*

²⁴ *Id.* at ¶¶74-84.

²⁵ *Id.* at ¶79.

²⁶ *Id.*

outweigh the potential benefits?²⁷ Beyond the upfront cost of designing, building and operating the spectrum sharing database, the Commission asserts that dynamic spectrum sharing would not appear to impose costs on public safety because it would retain priority access to the spectrum as needed.²⁸

Finally, the Commission invites comment on redesignation of the band in whole or in part for commercial services as the means to make more effective use of the band. That option raises all kinds of logistical issues, including how much and to what extent the spectrum is segmented, including any guard band that would be necessary to protect incumbent public safety entities in the band. It also raises broader questions about whether to auction the band, and whether the band would support 5G or unlicensed operations. Finally, the Commission invites related questions about how to treat incumbent public safety systems in the band, if it is redesignated for commercial use.²⁹

B. Expanding eligibility to include utilities and CII would make effective use of the band by supporting energy reliability and security while preserving and promoting public safety.

Expanding eligibility to include utilities and other critical infrastructure industries is the best way for the Commission to increase the use of the 4.9 GHz band while ensuring its continued effectiveness for protecting public safety. This is an idea whose time has come and is long overdue for implementation. In 2010, the Commission recognized that utilities and public safety have similar communications requirements and that synergies could be achieved by

²⁷ *Id.* at ¶83.

²⁸ *Id.* at ¶84.

²⁹ *Id.* at ¶¶85-86.

combining their resources together, just as many utilities and public safety entities had partnered to build statewide shared systems.³⁰ The Commission first considered expanding eligibility in the 4.9 GHz band to include CII in 2012 and NPSTC submitted its band plan that supported expanding eligibility to include CII in 2013. As UTC commented to the Commission then, expanding eligibility makes perfect sense because it would help enable utilities and other CII to meet their increasing communications needs while at the same time promoting public safety use of the band. Moreover, the concept has the support of NPSTC and other public safety organizations, who have commented on the record that utility use of the band would be complementary and compatible with public safety operations, unlike other operations such as commercial services that would cause congestion and interference and impair communications reliability that is so critical for public safety.

Utilities have enormous pent up demand for access to licensed broadband spectrum in order to meet increased regulatory requirements related to physical and cybersecurity and the continued implementation of grid modernizations technologies that are part of the larger Industrial Internet of Things. As utilities continue to invest in grid modernization technologies, there will be literally millions of devices that will monitor utility infrastructure to support real-time, two-way communications all the way to the meter, which will enable utilities to provide services much more reliably, safely, securely and efficiently. Utilities will know exactly when and where an outage has occurred, and may be able to predict faults before they occur – thereby

³⁰ See National Broadband Plan at 252 (stating that “The wide-area network requirements of utilities are very similar to those of public safety agencies. Both require near universal coverage and a resilient and redundant network, especially during emergencies.”) See also *Id.* at 254 (stating that, “[s]everal examples already exist of networks that are being shared successfully by public safety entities and utilities.”)

reducing restoration times or avoiding outages altogether. In addition, video surveillance of distribution and transmission substations and nuclear power plants as well as power quality monitoring through advanced technologies such as synchrophasors will provide much better data for utilities to balance electric loads and protect critical infrastructure against threats to physical and cybersecurity.

To enable many of these advanced applications, utilities will need to extend the coverage and the capacity of their private internal communications networks. As UTC, EEI, NRECA, and GridWise have previously reported to the Commission, utilities lack access to broadband capacity at many of their substations, and the IP Transition has resulted in the discontinuance of commercial communications leased lines that only compounds the problems that utilities face when trying to monitor and control these critical assets. Meanwhile, the amount of communications traffic required by these critical assets is increasing exponentially, due to grid modernization and physical and cybersecurity regulatory requirements. Additionally, utilities are deploying intelligent electronic devices all across their network infrastructure, including sensors for distribution automation and protective relaying systems that must be able to instantaneously reroute power or isolate faults in a matter of milliseconds. This grid modernization is occurring at a time when commercial communications demand for spectrum is increasing as well, creating a potentially unsustainable situation. Commercial interests are competing for the same limited spectrum resources as essential utility services.

That is why the 4.9 GHz band represents an important opportunity for utilities and other critical infrastructure industries to help meet their increasing communications needs. The band would provide access to up to 50 MHz of spectrum overall, which would greatly assist with supporting certain utility applications, such as enhanced SCADA for greater substation

monitoring and control. While the propagation characteristics of the band may limit its potential for wide area utility applications, the band certainly provides substantial capacity for point-to-point or local area point-to-multipoint network applications. Utilities could also potentially use the band for mobile applications, such as Unmanned Aerial Systems (UAS) for system inspection and maintenance, as well as restoration and recovery in the aftermath of hurricanes and other disasters.

C. Utilities report how they would make effective use of the 4.9 GHz band if the Commission expands eligibility to include CII on a co-primary basis with public safety.

In response to the FNPRM, UTC surveyed its members to determine how they plan to use the 4.9 GHz band, including the types of applications, the requirements for reliability and availability, and the bandwidth they would need. UTC also asked about the modulation, duty cycle and deployment timelines they planned to use. Not surprisingly, the responses from utilities were strong across the board in terms of the applications they would support--primarily SCADA, but also distribution automation and video surveillance, as well as other applications closely behind in terms of priority. More importantly for gauging the extent to which utilities would make effective use of the band, the vast majority reported that they would need between 20-40 MHz of bandwidth – almost twice as many that reported that they would use 5-10 MHz of bandwidth. As expected, all of the utilities reported that they planned to use the band for fixed operations, but surprisingly half reported that they planned to use the band for mobile operations as well. About half of the utilities reported that the duty cycle for their transmissions would be 50-100% and about another half of the utilities reported that the duty cycle would be between 10-50%. Finally, about a third of the utilities reported that they planned to deploy over 1000 units (transceivers) using the 4.9 GHz band, and a third of the utilities reported that they would deploy

within the next year and another 50% reported that they would deploy within two to five years with the bulk of the deployment overall being completed within five years.

These results clearly demonstrate that utilities would make effective use of the band. An interesting point stemming from the survey was not only the extent to which utilities would use the band, but also the importance of reliability in terms of why they would use it. Specifically, almost 50% of utilities reported that they would need 99.995% availability or better and the remaining utilities reported that they would need either 99.995% or 99.5% or less availability. Moreover, nearly two-thirds of utilities reported that in the aftermath of a disturbance such as a fault, lightning strike, earthquake, or storm they would need Class A reliability (i.e. Class A: Must work before, during and after a disturbance), and only one-third reported that they would need Class B reliability (i.e. Class B: Must work before and after a disturbance). None of the utilities reported that they would only need Class C reliability (i.e. Class C: Must work before a disturbance). A vast majority of utilities also reported that they plan to use the 4.9 GHz band for links that would run 5 miles or more in distance, although about a third reported that they would use the band for distances of 5 miles or less. Accordingly, they also reported that they would generally need output power and Equivalent Isotropically Radiated Power (EIRP) of 1, 2 or 5 watts, which is again a reflection of the need for longer range and higher reliability.

D. The Commission should adopt the NPSTC Band Plan recommendations supporting CII eligibility based upon the existing definition of CII in the Commission's rules, and it should allow utilities to use the band for UAS.

UTC, EEI, NRECA, and GridWise support the recommendations within the NPSTC Band Plan for immediate co-primary access to Channels 6 and 7 during the first three years, to establish a notice procedure for CII access to the remainder of the band during the three-year

period, and to open up the entire band to CII thereafter.³¹ The NPSTC Band Plan addresses the need for utilities and CII to immediately access 10 MHz of the band, and at the same time it provides a three-year transition period during which utilities would be able apply for additional channels, subject to a 30-day notice period that would allow public safety entities the opportunity to either apply for the same channels and build their own systems in that area within one year or alternatively partner with utilities and CII to build and operate shared systems using those channels together.

The Commission should enable utilities and CII to make effective use of the band. In that regard, the Commission should allow utilities to use channels that are designated for UAS operations, which will assist with damage assessments and service restoration in the aftermath of hurricanes and other natural disasters. Accordingly, the Commission should not exclude Channels 1-5 from CII eligibility in light of the Commission's proposal to dedicate this segment of the band to public safety aeronautical mobile and robotic use.³²

In addition, UTC, EEI, NRECA, and GridWise support the Commission's use of the existing definition of CII in Section 90.7 of the rules for purposes of eligibility in the 4.9 GHz band. This definition can be readily applied and is based upon the Commission's statutory authority, as well as the Commission's recognition of the important role that CII play in emergency response.³³ Although it is true that the Commission has tended recently to adopt

³¹ *FNPRM*. at ¶72

³² *Id.*

³³ Section 90.7 defines "Critical Infrastructure Industry (CII)" as "Private internal radio services operated by State, local governments 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, provided these private internal radio services (i) are used to protect safety of life, health, or property; and (ii) are not made commercially available to the public." *See also Improving Public Safety Communications in the 800 MHz Band*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd

flexible licensing approaches that avoid set asides, limiting eligibility to CII would be appropriate here given the fundamental public safety purpose of the band and CII's support for public safety generally. Moreover, the Commission could borrow from its own precedent in order to distinguish and differentiate utilities and CII from other entities seeking to claim eligibility. In that regard, the Commission has already distinguished utilities for purposes of the auction exemption for "public safety radio services" under Section 309(j)(2) of the Communications Act, finding that utilities uniquely qualify because they (1) have an infrastructure that they use primarily for the purpose of providing essential public services to the public at large; and (2) need, as part of their regular mission, reliable and available communications in order to prevent or respond to a disaster or crisis affecting the public at large.³⁴ For all of these reasons, the Commission can and should expand eligibility to include utilities and other CII, as defined at Section 90.7 of the Commission's rules.

E. While utilities would make effective and compatible use of the band with public safety, expanding eligibility more broadly to commercial communications providers would jeopardize communications reliability and discourage investment in the band.

While utilities would make effective use of the band, UTC, EEI, NRECA, and GridWise submit that utility operations are also compatible, and in many ways, complementary with public

14969, 14971-73, ¶4, n. 11 (2004) (explaining that the definition of CII at Section 90.7 is based on the statutory language in Section 309(j)(2) of the Communications Act, and that it "is appropriate in this context because it recognizes that the very nature of the services provided by the included entities involves potential hazard to life and property and that CII entities often work hand in hand with public safety officials at the scene of an incident.")

³⁴ See *FNPRM* at ¶72 (inviting comment on how a set aside for CII would be consistent with the Commission's flexible licensing approach in other bands, and how CII entities' need for co-primary use of this band can be differentiated from the needs of other critical and safety-related industries that may seek access to this band in the future.) See also In the Matter of Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, WT Docket No. 99-87, *Report and Order and Further Notice of Proposed Rulemaking*, 15 FCC 22709 at ¶¶77-80 (2000)(explaining how utilities are an example of a type of entity that can be differentiated from other entities claiming they qualify as public safety radio service providers that are exempt from auction) .

safety operations in the band. As the Commission observed in the National Broadband Plan, utilities share similar communications needs with public safety and utilities work together with public safety during emergencies such as hurricanes. Utilities also have a long history of partnering with public safety to design, build and operate shared systems that conserve their available resource and actually result in much better communications for both utilities and public safety than if they operated independent systems. On that point, the NPSTC Band Plan specifically provides for a 30-day notice period to provide an opportunity for public safety entities and utilities to work together and develop shared systems in the 4.9 GHz band. Finally, UTC, EEI, NRECA, and GridWise believe that utility use of the band will also be relatively easy to coordinate with public safety systems because most of the utility operations will likely be fixed point-to-point or point-to-multipoint networks.

By contrast, UTC, EEI, NRECA, and GridWise believe (and public safety has agreed in comments on the record) that commercial use of the band will be incompatible and will not coexist well with public safety. It is entirely likely that commercial operations will cause interference and congestion, which is anathema to the fundamental characteristics of utility and public safety communications networks – high reliability and availability. Commercial use of the band will likely result in the displacement of public safety communications as more commercial operations enter the band and more public safety operations exit to avoid the interference. Therefore, UTC, EEI, NRECA, and GridWise submit that the public interest would not be served by expanding eligibility to include commercial services. UTC, EEI, NRECA, and GridWise are similarly concerned that leasing spectrum to commercial entities could also lead to harmful interference and congestion, as well. The option of leasing spectrum at least offers public safety some measure of control over the potential for interference and congestion, but

once the spectrum is leased, history in other bands has shown that it would be hard for public safety to ever get the band back. While dynamic sharing technologies exist that could help to mitigate some of the concerns associated with commercial access to the band, at some point the costs would outweigh the potential benefits. UTC, EEI, NRECA, and GridWise are concerned that technology solutions for sharing the band may unnecessarily delay access to the band by utilities as well as public safety and in the final analysis would impose unnecessary costs for using the band.

In conclusion, UTC, EEI, NRECA, and GridWise believe that expanding eligibility to include only utilities and critical infrastructure industries would make effective use of the band and would be compatible with public safety. By contrast, commercial use of the band would be incompatible and would effectively displace public safety and at least discourage investment in the band by utilities, due to interference and congestion that would affect reliability which both utilities and public safety require for their mission critical communications.

III. The Commission Should Promote the Use of the Band for Fixed Point-to-Point and Point-to-Multipoint Operations on a Primary Basis, and Permit Higher Power and Wider Channels, Particularly in Rural Areas.

A. Introduction

The Commission invites comment on whether to license fixed point-to-point (P-P) and point-to-multipoint (P-MP) operations on a primary basis, and it proposes a compromise that would allow licensees to use individual 1-MHz bandwidth Channels 14-18 for permanent fixed P-P and P-MP operations on a primary basis, while existing permanent fixed P-P and P-MP operations on individual 1-MHz bandwidth Channels 1-5 would remain secondary, with no such further licensing allowed on those channels due to the proposed aeronautical mobile and robotic

designation.³⁵ In that regard, the Commission proposes to dispense with any requirement of a showing of bandwidth needed for P-P and P-MP links, as recommended within the NPSTC Band Plan.³⁶ Meanwhile it proposes to adopt the NPSTC Band Plan recommendation limiting temporary P-P links to be operated for thirty days maximum over a given path in a one-year period. Finally, with regard to P-P and P-MP operations in the band, the Commission rejected comments that suggested limiting the band for fixed use only.³⁷

The Commission proposes to allow P-P transmitting antennas to operate with a minimum directional gain of 26 dBi, maximum 5.5 degree beamwidth and minimum 25 dB front-to-back ratio. The Commission believes that this proposal will enable users to deploy larger directional antennas and to produce narrower beam widths and more directional P-P links, which should enable co-channel users in congested areas to place links closer together and achieve greater frequency reuse.³⁸ In that regard, the Commission invites comment on whether it should adopt maximum EIRP limits in the band, based on comments by UTC and utilities which suggested power levels equivalent to maximum EIRP levels of 65.15 dBm for P-P and 55.15 dBm for P-MP to “promote the use of the band for longer range communications . . . , particularly in rural areas.”³⁹ In that regard, the Commission invites comment on the potential that such an EIRP would create for interference, as well as difficulties for mobile operations in the band.⁴⁰ Finally,

³⁵ *Id.* at ¶48.

³⁶ *Id.* at ¶50.

³⁷ *Id.* at ¶51.

³⁸ *Id.* at ¶56.

³⁹ *Id.* at ¶57, *citing* Comments of UTC to the Fifth FNPRM at 12).

⁴⁰ *Id.*

the Commission rejected comments that suggested restrictions on multiple-input, multiple-output (MIMO) in the band.⁴¹

B. Fixed operations should be licensed on a primary basis to ensure reliability.

UTC, EEI, NRECA, and GridWise support changes to the technical rules that would promote opportunities for utilities to use the band for fixed operations that would be capable of supporting mission critical communications. First and foremost, UTC, EEI, NRECA, and GridWise advocate for point-to-point and point-to-multipoint operations to be licensed on a primary basis. As UTC has explained in its previous comments to the FCC, utilities need high reliability and they cannot risk interference to mission critical communications. Moreover, most of the utility applications would be fixed point-to-point and point-to-multipoint systems that would communicate with substations and distributed automation systems throughout their transmission and distribution networks – including in remote areas. Therefore, it is imperative that these fixed operations be licensed on a primary basis. Accordingly, UTC, EEI, NRECA, and GridWise advocate that the Commission change the current rule that licenses certain fixed operations on a secondary basis in the band.

C. Higher power and wider channels should be permitted to promote communications reliability, and utilities should be permitted to use the band for aeronautical operations.

Similarly, UTC, EEI, NRECA, and GridWise advocate for higher power operations to support longer links and wider channels to provide additional capacity. As noted above, utilities must maintain communications with critical assets that are often located in remote areas. Some of these critical assets need video surveillance to meet regulatory requirements for physical and

⁴¹ *Id.* at ¶58.

cyber security. As such, utilities will need high capacity connectivity using wider channels and they will need the capability to operate with higher power or higher gain in order to support longer links into some of the remote areas where their critical assets are located.

Therefore, UTC, EEI, NRECA, and GridWise support suggested power levels equivalent to maximum EIRP levels of 65.15 dBm for P-P and 55.15 dBm for P-MP to “promote the use of the band for longer range communications . . . , particularly in rural areas.”⁴² UTC, EEI, NRECA, and GridWise submit that fixed operations can be coordinated to avoid interfering with mobile operations in the band, and that allowing higher power/higher gain fixed operations that use wider channels will not impair the use of the band for mobile operations. The Commission acknowledges as much in the FNPRM, and has tentatively concluded not to limit channel aggregation to 20 MHz as NPSTC recommended. Instead, it is proposing to allow channel aggregation of up to 40 MHz.⁴³

UTC, EEI, NRECA, and GridWise support the Commission’s proposal to permit 40 MHz channel aggregation limits and agrees with APCO and the Commission that it will not impair the use of the band by public safety. UTC, EEI, NRECA, and GridWise also support the Commission’s proposal to lift the restriction on aeronautical operations and to designate channels 1-5 for aeronautical operations.⁴⁴ Utilities are interested in using the 4.9 GHz band for communications with UASs to inspect and maintain utility transmission and distribution

⁴² See Great River Energy Comments at 15; Nebraska Public Power District Comments at 3; and UTC Comments at 12 in WP Docket No. 07-100 (filed Nov. 11, 2012) (proposing maximum ERP of 63 dBm for P-P and 53 dBm for P-MP. EIRP = ERP + 2.15 dB. So, the maximum EIRPs would be 65.15 dBm for P-P and 55.15 dBm for P-MP).

⁴³ FNPRM at ¶10, citing UTC Comments on Fifth FNPRM at 12 (stating that “30 MHz wide channels . . . will support OC3 capacity traffic.”)

⁴⁴ *Id.* at ¶¶12-24.

infrastructure, and moreover, to conduct damage assessments in the aftermath of hurricanes and other natural disasters. Accordingly, the Commission should designate channels 1-5 for aeronautical operations and it should allow utilities and other CII to use those channels, not just public safety entities.

IV. The Commission Should Require Incumbents to Register Their Operations in the ULS Database, and Should Improve Coordination and Application Processes to Protect Against Interference and Promote Greater Use of the Band.

A. Introduction

In order to protect against interference, the Commission also proposes to require certified frequency coordination for licensing in the 4.9 GHz band, and it invites comment on whether to limit 4.9 GHz band coordination to public safety coordinators or whether to allow coordination by non-public safety coordinators as well.⁴⁵ In this regard, the Commission tentatively concludes not to require coordinators to submit applications for Regional Planning Committee (RPC) review generally, but it does agree that with NPSTC's recommendation to require RPC review when the power-flux density (PFD) into an adjacent RPC would exceed -109 dBW/m². The Commission invites comment on its tentative conclusion and the appropriate PFD and the reference bandwidth that should apply.⁴⁶

The Commission acknowledges that the existing licensing approach in the band has led to inaccurate data, and it has proposed that incumbent licensees should register their systems with the ULS database within one year in order for them to be protected against interference through

⁴⁵ *Id.* at ¶¶ 27-30.

⁴⁶ *Id.* at ¶29.

the frequency coordination process.⁴⁷ The Commission proposes to allow RPCs the flexibility to file new and amended regional plans for Commission review and approval to reflect their region-specific needs or considerations as supported by a showing of need.⁴⁸ In that regard, the Commission proposes modifying the NPSTC Band Plan recommendations to allow RPCs to limit aggregations to 20 megahertz, and to limit the ability of RPCs to restrict non-public safety licensing eligibility to a greater degree than is provided in the Commission's rules.⁴⁹ The Commission proposes to provide flexibility for RPCs to request changes outside these areas pursuant to a waiver request.⁵⁰ In that regard, the Commission invites comment on the appropriate timeframe in which to require RPCs to submit their regional plans to the Commission. The Commission also invites comment on whether to adopt standards for equipment to be used in the band.

B. The Commission should require incumbents to register their systems in the ULS database.

UTC, EEI, NRECA, and GridWise support the Commission's proposal to clean up the 4.9 GHz band, which has reportedly been subject to interference due to the informal licensing approach that was initially established for the band to provide flexibility for 911-type scenarios to allow for hot-spot communications from multiple first responders converging into a disaster or other emergency. Specifically, UTC, EEI, NRECA, and GridWise support requiring incumbents in the band to register their systems with the Commission's Universal Licensing System (ULS) database within one year in order for them to be protected against interference

⁴⁷ *Id.* at ¶¶31-38.

⁴⁸ *Id.* at ¶42.

⁴⁹ *Id.*

⁵⁰ *Id.* at ¶43.

through the frequency coordination process. This should address the lack of accurate data that currently exists about systems in the 4.9 GHz band. Moreover, UTC, EEI, NRECA, and GridWise support using the ULS as the database for coordinating 4.9 GHz systems.

C. The Commission should require frequency coordination by existing public safety coordinators.

UTC, EEI, NRECA and GridWise also support requiring frequency coordination by public safety coordinators to protect against interference going forward. That said, the Commission should consider allowing non-public safety coordinators to conduct frequency coordination in the 4.9 GHz band, if problems arise (e.g. delays, backlogs, or discriminatory treatment of non-public safety applications, including pricing or processing). In that regard, UTC, EEI, NRECA, and GridWise support the Commission's proposal not to require coordinators to submit applications to RPCs, except when the PFD into an adjacent RPC would exceed -109 dBW/m². That should streamline the process and avoid unnecessary delays in coordinating applications. Overall, UTC, EEI, NRECA, and GridWise continue to believe that public safety coordinators are best-positioned to coordinate systems in the 4.9 GHz based upon their experience and knowledge with respect to incumbent systems and regional plans, and we support allowing public safety coordinators to coordinate applications for non-public safety use of the 4.9 GHz band.

D. The Commission should permit flexibility for wider channel aggregation for higher capacity communications.

UTC, EEI, NRECA, and GridWise support the Commission's proposals to allow wider channel aggregation in the 4.9 GHz band and to limit the ability of RPCs to restrict non-public safety licensing eligibility in the band. As UTC has commented previously in this proceeding and it reiterates in its comments here, utilities need the flexibility to use wider channels for

higher capacity for some of their microwave communications systems. In that regard, UTC, EEI, NRECA, and GridWise support the Commission's proposal to modify the NPSTC Band Plan recommendations to allow RPCs to limit aggregations to 20 megahertz. The Commission's proposal to provide flexibility for RPCs to request a waiver to change an applicant's channel aggregations strikes a reasonable balance between accommodating the need of utilities to support higher capacity systems while at the same time protecting against potential interference. Finally, UTC, EEI, NRECA, and GridWise do not recommend a specific timeframe in which RPCs should submit their plans, but we do recommend that RPCs be encouraged to do so quickly in order to assist with the overall clean-up of the 4.9 GHz band and the registration of incumbent systems in ULS. Similarly, we defer at this time regarding the issue of adoption of specific standards for equipment in the band, but it agrees in principle that the development of standards should reduce costs and promote more intensive use of the band.

CONCLUSION

WHEREFORE, the premises considered, UTC, EEI, NRECA, and GridWise respectfully request that the Commission expand eligibility to include utilities and other critical infrastructure industries, and that it also revise the technical rules to clean up the 4.9 GHz band and enable the use of wider channels and longer links to help utilities make effective use of the band. UTC, EEI, NRECA and GridWise emphasize that communications reliability is essential for utilities and public safety, and that limiting eligibility to utilities and public safety will serve to protect against interference and congestion from commercial operations that would undermine communications reliability and discourage utility investment and effective use of the band. UTC, EEI, NRECA, and GridWise also reiterate that while access to the 4.9 GHz band comes at a critical time for the electric industry and would support energy reliability and security, the Commission should not consider the 4.9 GHz band as a substitute for continued access to the 6 GHz band by utilities. Access to that band on an interference-free basis will continue to be essential for utilities.

Respectfully,

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