6 GHz Spectrum Band Proceeding—History and Talking Points

Background: Nearly every critical infrastructure industry (CII) in the U.S., including electric, natural gas, and water utilities, own and operate sophisticated communications systems to support the reliable, safe, and efficient delivery of essential, life-preserving services. These systems provide surveillance, security, and protection of critical utility assets, such as power lines, substations, pipelines, control rooms, and much more. Additionally, utilities use communications to restore service after natural disasters and are increasingly important for smart-grid and other technological advances in the industry.

Utility communications systems use both wireless and wireline technologies. Wireless services allow utilities to cost-effectively monitor and operate their assets in remote areas where using wireline systems is cost-prohibitive. Any wireless communication relies on radiofrequency spectrum to operate; commercial spectrum allocation is overseen by the Federal Communications Commission (FCC or the Commission).

Spectrum is foundational to the safe, secure, and reliable delivery of low-cost power to the public, and it is key to modernizing the energy grid. It is also a finite commodity, and our nation's spectrum needs are growing. Electric utilities understand this.

Like many critical infrastructure industries, electric, water, and natural gas utilities own and manage their own communications network to support their mission-critical functions. Electric, water, and natural gas utilities require high levels of communications reliability with lower latency

than commercial communications companies can either provide or will not provide at a reasonable cost. In addition, many utility assets are in remote locations not served by commercial communications companies.

Issue: The FCC is proposing to allow unlicensed operations in the 6 GHz spectrum band. Electric, water, and natural gas utilities use the 6 GHz band for mission-critical wireless communications, including:

- Real-time monitoring of high and medium voltage transmission lines, gas pipelines, and water treatment and distribution systems;
- Supervisory Control and Data Acquisition (SCADA), a critical situational awareness tool;
- Teleprotection (essential for selectively isolating faults on high-voltage transmission lines, transformers, reactors and other important items of electrical plants); and
- Voice communications (essential for service restoration/storm response)

Compromises to any of these communications could severely impede the reliable, safe, and secure delivery of electricity, water, and natural gas. Allowing unlicensed operations would likely result in interference to these critical communications. Interference either delays or degrades the integrity of communications being sent across the band. Given that these systems must operate in milliseconds, delayed or faulty data will have negative operational impacts.

Key Points:

- If adopted as proposed, the FCC's plan to expand access to the 6 GHz band to unlicensed users presents the risk of damaging interference to mission-critical utility communications systems. The mitigation measures proposed by the agency are untested and unproven, and even the proponents of unlicensed sharing in the band cannot yet guarantee the mitigation measures will not be resolved.
    - Nokia April 22 article—interference likely under current proposal
    - RigNet July 11, 2019 ex-parte filing—interference could be "catastrophic"

- Interference to electric, water, and natural gas communications systems can reduce situational awareness and delay critical data being transmitted.
    - Remedying interference after-the-fact does not resolve the initial impact such interference will have operationally;
    - The mobile nature of these unlicensed devices will make identifying and pinpointing the cause of the interference extremely difficult; and
    - Interference to systems that must operate in milliseconds will cause operational impacts that will degrade the delivery of reliable utility service. For example, electricity delivery must balance demand and supply on a real-time basis to avoid fluctuations in the system, which cause power disruptions.

- Comments jointly filed by the American Petroleum Institute, American Public Power Association, American Water Works Association, Edison Electric Institute, National Rural Electric Cooperative Association, and Utilities Technology Council oppose the current proposal.
    - Represents nearly every single electric utility in the U.S., along with major oil/gas companies, and thousands of water/wastewater companies

- In addition, public safety and large commercial communications providers oppose opening the band due to the unreasonable risk that interference from unlicensed operations poses to the operational reliability, safety and security of the essential services that they provide.
    - Entities opposed/concerned include: AT&T, CTIA, American Association of Railroads, National Academy of Sciences, Association of Public-Safety Communications Officials, National Public Safety Telecommunications Council, Nokia, National Football League, RigNet, and the cities of New York, Denver, Los Angeles, Kansas City,

- The risk of interference cannot be mitigated effectively by the proposed AFC. AFC is still an unproven concept that has not been tested, and there are serious flaws that have been identified, which draw into question its effectiveness. The only proven means of preventing interference in the 6 GHz band is prior coordination, and there is no evidence that AFC will prevent interference from occurring.

- If the Commission does decide to allow unlicensed operations in the 6 GHz band, it must adopt rules that would improve interference protection by AFC. These rules include:
    - Requiring AFC for both indoor and outdoor unlicensed operations;
    - Securing the AFC system, particularly considering the potential threat of cyber-attacks to mission critical communications by utilities and other critical infrastructure; and
    - Testing the AFC system so it is proven to protect against interference to microwave systems, prior to allowing any unlicensed operations in the 6 GHz band.

Resources

- Utility Communications 101 https://utc.org/wp-content/uploads/2018/10/About-Utility-Comms-101.pdf
- Group of 12 Senators Nov. 5 letter to the FCC: https://utc.org/wp-content/uploads/2019/11/Risch_FINAL-FCC-Letter-re-6-GHz.pdf
- Department of Energy Sept. 3 letter to the FCC, NTIA, and Department of Commerce urging testing of mitigation system, dedicated utility spectrum: https://utc.org/wp-content/uploads/2019/09/FCC-Chairman-Pai-response-letter-9.3.19-003.pdf
- Testimony of UTC President and CEO Joy Ditto June 24 to the Federal Energy Regulatory Commission: https://utc.org/wp-content/uploads/2019/08/FINAL_Statement-of-UTC-CEO-Joy-Ditto_Reliability_Conference_6.27.19.pdf
- Senator Murkowski's June 14 letter to the FCC: https://utc.org/wp-content/uploads/2019/07/2019_06_14_Pai_6GhzSpectrum_Murkowski.pdf
- California House Delegation April 30 letter to the FCC: https://utc.org/wp-content/uploads/2019/05/20190430-6-GhZ-Spectrum-LTR-FINAL.pdf
- Senator Kennedy's April 1 letter to the FCC : https://utc.org/wp-content/uploads/2019/04/4.1.19-6GHz-Letter-to-FCC_Kennedy.pdf
- Issue brief on 6 GHz https://utc.org/wp-content/uploads/2019/03/2019_3_IssueBrief_6GHz.pdf
- Comments with EEI, API, NRECA, APPA, and American Water Works Association to the FCC: https://utc.org/wp-content/uploads/2019/02/FINAL_6-GHz-Comments_with_addendum.pdf
- Report on how utilities use 6 GHz for SCADA, etc. (lots of good stuff in here, highly technical but worth a read to better understand the issue) https://utc.org/wp-content/uploads/2019/02/Spectrum-and-Utility-Communications-Networks-2.pdf