



# 6 GHz Update

Presentation to the WECC TCOMS—Telecommunications Subcommittee

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Utilities Technology Council  
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# About UTC

- UTC is the international association for the telecom & information technology interests of electric, gas and water utilities and other critical infrastructure industries.
- Founded in 1948, based in Arlington, VA with independent operating units for Europe and Latin America.
- UTC's members include all kinds of utilities, such as large investor-owned utilities to smaller rural electric cooperatives and municipal utilities.
- UTC's members own, manage and operate extensive private wireless and wireline communications systems that they use to ensure the safe, secure and reliable delivery of essential energy and water services.

# Public Policy Division



- Chair: Holly Henderson, Southern Company
- When: Monthly meetings on the 3d Thursday at 2-3:00 pm ET
- What: Provides UTC and its staff with direction and leadership on public policy issues. Reviews legislative and regulatory issues pending before the FCC, Congress and the federal courts, as well as state PUCs and legislatures; and develops comments and other advocacy positions.
- Who: PPD meetings are open to core utility members.

# 6 GHz Current Status

- FCC Proceedings
  - 2020 Report and Order and Further Notice of Proposed Rulemaking (ET Docket No. 18-295)
  - Interference studies filed by Southern (7/2021), Evergy (12/2022), FirstEnergy (Phase I, 10/2022; Phase II, 5/2023), ND (
  - 2021 Petition for Rulemaking and Request for Stay
  - 2021 US Court of Appeals for the DC Circuit decision affirming the FCC rules, generally
  - 2022 FCC conditionally approves AFC system operators (ET Docket No. 21-352)
    - 8/2023 FCC announces commencement of AFC system testing
    - 2/2024 FCC formally approves initial seven AFC system operators after testing
    - 6/2024 FCC grants waiver to allow AFC system operators to change codes
  - 2023 Second Report and Order permits partial VLP operations (ET Docket No. 18-295)
  - 12/2024 FCC grants waiver to allow AFC system operator to adjust for building entry loss (ET Docket No. 23-107)
    - 1/2025 Application for Review filed against FCC waiver allowing AFC systems to adjust for BEL
  - 12/2024 FCC grants waiver to allow weatherized enclosures on LPI devices operating in indoor sports venues (23-282)
  - 2025 Third Report and Order permits VLP operations in remainder of the band (ET Docket No. 18-295)
- DOE Outreach
  - Technical, Policy and Financial Solutions
    - Technical = interference testing and spectrum sharing testing
    - Policy = new rules, process for sharing spectrum
    - Financial = cost reimbursement
  - 10/2024 INL publishes 7-8 GHz Point-to-Point Testing report finding:
    - interference to microwave links that would be detrimental to grid operations. For example, Wi-Fi signals with power levels approximately 100 times lower than the microwave signals at the receiver cause the microwave link to be inoperable.
    - Traditional methods of analysis that focus on simulation miss important aspects of interference. Over-the-air testing shows that simulation can be an order of magnitude off when estimating the interference levels that impact microwave links.
    - Relying on reports from the field of interference for spectrum management generate a false sense of success. Current equipment metrics do not provide enough clarity for when or how much interference impacts operations.



# Interference Studies

- Southern Company/EPRI/Lockard & White
  - Discovered beacon signals that transmitted nearly constantly and produced interference levels up to 10 dB at one location 285 meters away.
  - Measured interference from broadband transmissions as high as 25.7 dB I/N when LPI transfer rate was 100 Mbps at same location 285 meters away.
- First Energy/EPRI/Burns & McDonnell
  - Additive interference to FS operations occurs from simultaneous co-channel operation of multiple RLANs located inside customer homes, both inside and outside of the microwave beam.
  - FS antenna sidelobes create vulnerable locations for RLAN interference at close ( $< 1\text{ km}$ ) distances. Elevation mismatch between the microwave antenna and 6E Wi-Fi devices did not prevent interference in these situations.
  - While the study focused on additive interference, it was consistently demonstrated that a single Wi-Fi 6E device can impact the microwave signal link margin.
  - Even “beacon-only” operation is capable of causing harmful interference, producing Interference to Noise ratio (“I/N”) values above the FCC’s Interference Protection Criteria (“IPC”) of -6 dB I/N, including as high as 9.1 dB I/N.
  - Contention Based Protocol (“CBP”) only partially effective preventing additive interference when RLANs are clustered very closely ( $< 100\text{ m}$ ).
  - CBP is not effective in preventing additive interference from multiple RLANs that are distant ( $> 1\text{ km}$ ) from each other or shielded from each other.
  - Small changes in the location of a 6E Wi-Fi device can result in large changes in impact
- Evergy/Burns & McDonnell
  - Measured interference as high as 24.5 dB I/N at one location 1.3 miles away from the LPI device that was placed in the window of a classroom and set to 950 Mbps data rate.
  - Reliability after impact: After impact, reliability was reduced from 99.999% to 99.997 % uptime.
  - Outage time after impact: Annual outage times under optimum atmospheric conditions resulted in 2:30:40 hours.
- University of Notre Dame
  - Uses Received Signal Strength Indicators (RSSI) (i.e., cellphones) at University of Michigan and University of Notre Dame and estimates RSSI levels range from -45 dBm to -94 dBm in a dense LPI deployment and concludes that “this does not pose an interference risk to incumbents.”

# National Spectrum Strategy

- NTIA in collaboration with FCC and other agencies has established an Implementation Plan based on the four pillars of the NSS.
- The Four pillars of the National Spectrum Strategy framework, include:
  - Pillar One: A Spectrum Pipeline to Ensure U.S. Leadership in Advanced and Emerging Technologies
    - Identifies five spectrum bands for further **near-term** study for sharing, including the **7125-8400 MHz** band.
    - Includes guiding principles for near-term allocation, which involve **soliciting input from all stakeholders, data-based analysis, coordinated execution of plans** to repurpose spectrum, and **ongoing monitoring**.
  - Pillar Two: Collaborative Long-Term Planning to Support the Nation's Evolving Spectrum Needs
    - Includes coordinated, collaborative framework for long-term spectrum planning to develop **robust processes that incorporate the full input of industry stakeholders, federal agencies, and advisory groups** in spectrum allocation decisions.
    - Emphasizes **evidence-based methodology** for spectrum allocation decisions to support **transparent allocation decisions** and develop **values-based models**—as well as best practices for technical and economic analyses—that quantify the benefits of different spectrum allocation options.
  - Pillar Three: Unprecedented Spectrum Innovation, Access, and Management through Technology Development
    - 1) Establish spectrum testbeds; 2) Develop a National Spectrum Research and Development (R&D) Plan; and 3) Encourage private-sector R&D.
  - Pillar Four: Expanded Spectrum Expertise and Elevated National Awareness
    - Create a National Spectrum Workforce Plan, and educate policymakers and the public

# 6 GHz Next Steps

- If you see 6 GHz interference, say something (to UTC)!
- UTC meeting with new administration to address 6 GHz interference.
- UTC will hold a Policy Summit in Washington, DC on July 22-23d for utilities to strategize with each other and engage with policymakers to address 6 GHz and other telecom issues, including spectrum, broadband, security and pole attachments.
  - Contact UTC to learn more and participate in the Policy Summit.

# Questions



## UTC Public Policy Division

Next monthly meeting is **March 20 • 2PM - 3PM ET**



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### The Intersection

[utc.org/podcast](https://utc.org/podcast)



### UTC Journals

[utc.org/journals](https://utc.org/journals)