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By Electronic Filing Notice of Ex Parte Presentation

August 31, 2022

Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, NE
Washington, DC 20554

Re: Unlicensed Use of the 6 GHz Band (ET Docket No. 18-295); Expanding Flexible Use in the Mid-Band Spectrum Between 3.7 and 24 GHz (GN Docket No. 17-183).

PROTECT MISSION-CRITICAL COMMUNICATIONS

This filing by the National Spectrum Management Association (NSMA) (i) reflects deep concern about possible and unnecessarily dangerous breakage to mission-critical communications network operations due to the pending authorization and deployment of unlicensed 6 GHz devices, and (ii) suggests a solution.¹

BACKGROUND:

Due in part to an increasingly complex spectrum management environment the public has been made increasingly aware of potential systemic failures involving large-scale systems that rely on fail-safe spectrum management.

For example, early this year an ongoing debate between the Federal Aviation Administration (FAA) and the Federal Communications Commission (FCC) concerning the use of new 5G mobile services near airports resulted in nearly grounding airline fleets at major airports nationwide.² What has failed to gain

¹ NSMA is a voluntary association of individuals involved in the spectrum management profession including service providers, manufacturers, frequency coordinators, engineers, regulators and consultants. Established in 1984, at the request of the FCC, NSMA provides a forum to develop industry guidelines for efficient use and management of the frequency spectrum by the wireless telecommunications community. NSMA provides a linkage between government regulations and industry practice by developing recommendations that streamline and standardize procedures used by the frequency coordination community. We strive to provide an open forum for stakeholders to mold responsible spectrum industry practice and resolve conflicts. www.NSMA.org

² *How 5G Clashed With an Aviation Device Invented in the 1920s: The potential for interference between 5G signals and the radio altimeters long used by pilots has divided the telecom and aviation industries*, New York Times, (January 19, 2022), <https://www.nytimes.com/2022/01/19/business/5g-radio-altimeters-airlines.html?searchResultPosition=3>

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the same attention is a similar issue that poses an even potentially greater risk across the entire US that could impact mission-critical communications from First Responders, utilities and others.

On April 20, 2020 the FCC released a Report and Order³ introducing unlicensed use in portions of the 1200 megahertz of spectrum in the 5.925-7.125 GHz (6 GHz) bands. This rule change allows the introduction of an estimated 1 billion unlicensed Wi-Fi devices into the 6 GHz bands. The spectrum in question contains over 100,000 links of microwave radio that provide very sensitive mission-critical communications infrastructure for Police, Fire, Ambulance, Power Plants and distribution, Water Utilities, Oil & Gas Pipelines, State and Local Governments, Railroads as well as Mobile Service Providers (AT&T, Verizon, T-Mobile and smaller regional carriers). The information these microwave links carry support Police and Fire communications for officers that protect and serve our communities. Utilities and Pipelines who use these communication links to monitor and control their critical networks. Railroads use these communication links to control their train networks. These networks are pervasive across the United States as represented by the map below and are designed for and require extremely high-quality signal availability, typically 99.9995% or greater.

This signal availability design *requires less than 158 seconds of impacted communications per year.*

Below is a sampling of comments filed with the FCC related to this serious concern.

Utilities Technology Council (UTC), the National Rural Electric Cooperative Association (NRECA), the Edison Electric Institute (EEI), the American Gas Association, the American Public Power Association (APPI), the American Petroleum Institute (API), American Water Works Association, the National Public-Safety Telecommunications Council (NPSTC), Nuclear Energy Institute, the International Association of Fire Chiefs (IAFC), the Association of Public-Safety Communications Officials International (APCO) and the Association of American Railroads (AAR):

“Recent real-world tests have determined that 6 GHz LPI devices will cause harmful interference to licensed microwave systems in the band...”⁴

AT&T

“...the FCC’s order will allow the introduction of devices that can impair, or even knock out, links in the networks that monitor our electric grid, enable first responders to

³ <https://docs.fcc.gov/public/attachments/DOC-363490A1.pdf>

⁴ <https://www.rrmediagroup.com/News/NewsDetails/NewsID/21207>

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communicate and provide mobile broadband services to millions of Americans, particularly in rural areas,”⁵



Figure 1: 6 GHz Nation Wide Microwave Networks
(Red lines represent the communication links)

RECOMMENDATION:

Real World Testing Accessible to Incumbent Mission-Critical Systems’ Licensees, to Unlicensed Device Manufacturers, and to a Credible Disinterested 3rd Party Validator

NSMA previously reported a 6 GHz Band audit of the FCC Universal Licensing System (ULS) which demonstrated that the “vast majority of licensed systems are mission-critical.”⁶

That NSMA filing provided a map showing that incumbent deployments covered all 50 states and Puerto Rico. NSMA recommends that, especially during this time when the nation is heavily reliant on these exact mission-critical networks (utility management, state police networks, national mobile networks, medical transport, medical facilities connectivity, wireless and wireline backbone and transport etc.), it is a requirement that well-known, actually-deployed, real-world scenario spectrum management tests be conducted well prior to launching unlicensed outdoor 6 GHz devices under automated frequency control (AFC) or regulatory actions to liberalize the rules related to deployment of unlicensed 6 GHz devices without AFC.

⁵ <https://www.attconnects.com/att-statement-on-fcc-order-to-allow-unlicensed-devices-in-6-ghz-band/>

⁶ NSMA April 15, 2020 ex parte in this proceeding; See also, NSMA October 2, 2019 ex parte at pp 3-6.

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Experience shows that live tests often produce data that is useful in validating designs and also on multiple occasions reveals new-data or anomalies that were not anticipated by table-top exercises or by non-peer-reviewed tests.⁷

Test Facilities:

The necessary testing facilities are readily available at locations like the federally-managed Idaho National Labs (INL) spectrum test bed, which is specifically designed to assess under real-world conditions whether mission-critical systems serving national infrastructure can safely collocate with other systems.⁸ Such tests should be conducted within the peer-review process and with transparency and the material input of all existing and proposed system services.

Facilities exist at INL in Idaho and Utah, and in the Washington, DC area. Numerous incumbent 6 GHz incumbent facilities in various locations across the country, especially those that are being temporarily off ramped for tower replacements, scheduled maintenance, facilities renovations, etc., could be potential, supplemental live incumbent test bed locations as well.

The peer-review process provides the ability to validate proposed designs, gather empirical evidence, and avoid subjecting the nation's infrastructure to experimentation. A variety of (i) best-case and (ii) worst-case scenarios, as defined by the incumbent and the unlicensed parties, are recommended for ensuring the tests reflect all conditions of special concern to interested parties.

The availability of 6 GHz incumbent devices for such tests is confirmed. The ability to make available for testing the various iterations of proposed unlicensed 6 GHz devices is also necessary for conducting industry-standard live testing. That will bring more empirical data to the record.

Federally-managed test beds and test protocols could make certain that (i) operations records are continuously recorded, (ii) that difficult to replicate scenarios are transparently available to all parties for peer-reviewed analysis, (iii) that professional spectrum management and coordination protocols are verifiably observed, and (iv) that all parties can remove uncertainty from their operations plans.

⁷ NSMA recognizes that unlicensed equipment undergoes some limited laboratory review by Telecommunications Certification Bodies (TCBs) as part of the FCC's equipment approval processes. 47 C.F.R. §§ 2.901-2.1093. NSMA maintains that such reviews by the TCBs are necessary, but not sufficient because they do not involve methodically placing the unlicensed devices in close proximity to mission-critical incumbent systems, especially not in the numbers, duration, and real-world settings that will realistically occur once large-scale deployments commence.

⁸ Idaho National Laboratory, Improving Wireless Communication, Reliability and Security, Wireless Testing, <https://inl.gov/wireless/>

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Validation by a disinterested third party of safe deployment and operational plans can occur which benefits all parties involved.

PRECEDENT:

Large-scale introduction of new devices:

Precedents of large-scale introduction of new unlicensed or new service devices are instructive.

In some instances, the 2400-2483.5 GHz band saw large-scale deployment of unlicensed devices while certain, low-unit volume licensed systems remained in operation in certain (typically rural areas). That scenario did not involve heavily occupied incumbent microwave networks. One scenario in which largescale licensed, mission-critical transport, backbone and backhaul networks were set for exposure to ubiquitous deployments by a new service, such deployments took place over a decade-long timeline and allowed for very careful exclusion zones and ultimately replacement of the transport, backbone and backhaul services under closely negotiated terms. See for example, the Spectrum Refarming Proceeding (PR Docket 92-235) at 2 GHz.

It is also instructive that the 5 GHz Unlicensed National Information Infrastructure (U-NII) device deployments resulted in a string of Notices of Apparent Liability (NALs) and related enforcement actions due to interference with Federal Aviation Administration (FAA), Military and privately-owned TV weather radar systems. The policing of those interference events taxed FAA and FCC resources.

CONCLUSION:

Due in part to an increasingly complex spectrum management environment the public has been made increasingly aware of potential systemic failures involving large-scale systems that rely on fail-safe spectrum management. It is time to ensure the future operations of 6GHz mission-critical systems will be undeniably proven safe.

It is strongly recommended that it be required that: (i) well-known, actual physically deployed 6 GHz trials and tests occur whereby actual unlicensed 6 GHz outdoor devices using AFC and other unlicensed 6 GHz devices permitted to operate without AFC are tested *en masse* in realistic scenarios around actual 6 GHz fixed wireless systems of the exact types and designs that are routinely used by mission-critical first responders and other incumbents, and (ii) these tests be conducted and peer-reviewed with access to the data from all interested parties and a credible and neutral 3rd party validator *well prior* to confirming the comprehensive launching of outdoor 6 GHz unlicensed services and related systems in those same 6 GHz incumbent channels and geographic locations. Experience shows that live tests often

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produce data that is useful in validating designs and also on multiple occasions reveals new-data or anomalies that were not anticipated by table-top exercises or by non-peer-reviewed tests.

The NSMA stands ready to assist with additional information about the FCC 6 GHz rule changes, and to do what it can to further advise on how to avoid systemic disruption to first-responder, utility and other mission critical networks.

Your interest in this very important proceeding is greatly appreciated. Thank you for your time and consideration.

/s/

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