



March 18th, 2019

The Honorable Ajit Pai
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Notice of Proposed Rulemaking on Unlicensed Use of the 6GHz Band
(ET Docket No. 18-295)

Dear Chairman Pai:

Pacific Gas and Electric Company (PG&E) hereby submits its comments in response to the Federal Communications Commission's Notice of Proposed Rulemaking on Unlicensed Use of the 6 GHz Band (ET Docket No. 18-295). PG&E supports the comments submitted by the Utilities Technology Council in opposition to expansion of the Licensed 6 GHz band to allow unlicensed access points and mobile devices. If allowed, this expansion will potentially affect the reliability of existing point-to-point licensed microwave radio systems which support critical electric and gas operations.

PG&E, incorporated in California in 1905, is one of the largest combined natural gas and electric energy companies in the United States. PG&E's primary business is transmission and delivery of energy. The company provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California. The operation of PG&E's system relies on more than 350 Licensed Microwave Radio paths in the 6 GHz frequency band transporting critical data.

PG&E agrees with the objections to the proposed rule change voiced by other utilities. The proposed change will likely have an adverse effect on PG&E's supervisory control and data acquisition (SCADA) systems (electric, gas, and generation), electric protection, and emergency radio communications systems. These systems are all used by PG&E to deliver natural gas and electric service to its customers.

The unpredictable nature of unlicensed operations within the Licensed 6 GHz band will introduce risks that will affect system reliability. Utility microwave radio paths are engineered and constructed to provide greater than "Five 9's" availability (>99.999%) to ensure proper

transmission of critical data. Given the tiny margin for error, these utility systems are highly vulnerable to interference. At the same time, due to the nature of the work, utilities rely on high system availability and cannot tolerate even momentary outages.

One example specific to PG&E is the need for additional communication links to support PG&E's wildfire hardening programs, including the Community Wildfire Safety Program (CWSP) and Public Safety Power Shutoff (PSPS) program. These initiatives are intended to improve the safety and reliability of power lines in wildfire prone regions of California. Successful implementation of these programs requires additional SCADA communications coverage. By allowing unlicensed users in the band, the proposed rule would inevitably reduce the availability of these microwave paths and increase the difficulty of successfully implementing these programs.

Private fixed microwave users such as PG&E and other public utilities have very few frequency band options for licensing point-to-point microwave paths. The limitations in other bands drive public utilities to invest in the only remaining viable option, the licensed 6 GHz frequency band. Allowing unlicensed users in this band will reduce its availability to public utilities.¹

PG&E recommends that unlicensed users not be allowed to operate in the 6 GHz frequency band. However, if the FCC proceeds with this proposed rule, there are several changes that must be made to ensure unlicensed users do not cause harmful interference to incumbent licensed users, and when interference inevitably happens it can be remediated.

Firstly, any system must allow all incumbents to locate unlicensed interference sources. Using traditional methods, it is extremely difficult to isolate the source of the offending signals, given their itinerant and mobile nature. It requires extensive manhours of training and troubleshooting with specialized equipment that is extremely costly and severely impacts maintenance budgets. None of these costs are incurred by incumbents today, as unlicensed operators are not allowed in this band. Any Automated Frequency Coordination (AFC) system must be designed to include a user-friendly way to locate all transmitters within the area of suspected

¹ The licensed 960 MHz does not provide the adequate bandwidth. Licensed 18 GHz does not allow for practical path length and lacks product support from microwave manufacturers. Licensed 11 GHz offers somewhat practical path length but is still only half that of 6 GHz and is susceptible to rain fading.



interference and provide contact information for the owners and a methodology to suspend operation in that frequency until resolution of the interference can be achieved.

Secondly, the AFC system must include a centralized design. The AFC system would communicate with access points and assign available operating frequencies. A centralized system is essential to insure accuracy. In contrast, a system based on "local lookups" will quickly become outdated and inaccurate.

Thirdly, the data supplied to the centralized AFC system cannot depend on the Universal Licensing System (ULS). The ULS is known to be inaccurate; these errors and the lack of real time updates will allow channel mis-assignments to unlicensed devices and adversely affect existing point-to-point microwave paths. Real time data gathering directly from the active radios is the only methodology to ensure data integrity to the AFC.

Finally, additional testing is required before any of the proposed rule changes are finalized. The mere possibility of introducing harmful interference and impacting vital communications for private fixed users should be cause enough for the FCC to consider more in-depth testing before proceeding with any of the proposed changes. The RKF engineering analysis submitted by the rule proponents is theoretical. Without real-world testing, the proponents' analysis is insufficient to prove that incumbents will not experience interference. Field testing should include actual devices and the completed AFC system in full operation.

The importance of the licensed 6 GHz frequency band and PG&E's critical operational need for reliable point-to-point microwave radio paths cannot be overstated. PG&E opposes the proposal to expand unlicensed operations to the 6 GHz band. However, if the FCC determines otherwise, we respectfully request that the FCC include controls to protect incumbents and allow licensed users to locate unlicensed interferers.

Respectfully Submitted,

Pacific Gas and Electric Company

A handwritten signature in blue ink, appearing to read 'N. Petrakis', is written over the company name.

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