

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

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

**COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS**

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)¹ submits the following comments in response to the Commission’s Further Notice of Proposed Rulemaking concerning unlicensed operations in the 6 GHz band.² The Commission should not take any further steps to expand unlicensed operations at the direct expense of licensed users before the shaky assumptions underlying the Commission’s authorization of unlicensed use across the band have been validated by real-world deployments.

Broadcasters rely on portions of the 6 GHz band (specifically those designated U-NII-6 and U-NII-8) to support their broadcast operations in a variety of ways, including fixed links

¹ The National Association of Broadcasters (“NAB”) is the nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

² *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852 (April 23, 2020) (R&O and FNPRM).

that deliver content from broadcast studios to transmitter sites, mobile transmissions from electronic newsgathering (ENG) trucks deployed to cover live and breaking news and on-site transmissions from portable cameras and microphones to a mobile studio. Each of these use cases is critical to providing the high-quality local coverage broadcasters are entrusted to provide and on which viewers rely. The ongoing COVID-19 pandemic demonstrates how critical this spectrum is to news coverage – not only have broadcasters used 6 GHz links to provide coverage of press conferences and updates from government officials to the public, but also to help enable fully remote newscasts when it became unsafe for broadcasters to be in their studios.

In its Report and Order, the Commission adopted rules permitting unlicensed low-power indoor (LPI) devices to operate at 5 dBm/MHz power spectral density EIRP despite substantial concerns broadcasters raised on the record about the significant potential for harmful interference to Broadcast Auxiliary Services.³ Time will tell if the Commission was correct in its determination that interference is unlikely to occur, despite broadcasters' substantiated concerns that the minimal protections the Report and Order establishes will prove insufficient. But it is plainly premature at this time to increase the power levels permitted for LPI operations by an additional 3 dB when there has been no opportunity to test the Commission's assumptions in the marketplace.

NAB is similarly concerned about the FNPRM's proposal to permit very low power (VLP) operation across the 6 GHz band, indoors and outdoors, with no automatic frequency coordination. None of the mitigation techniques or factors referenced in the FNPRM are likely to assure protection of BAS operations. As explained in more detail below, contention-based

³ R&O and FNPRM) at ¶ 110.

protocols are unlikely to be effective given the one-way nature of BAS operations. Similarly, while assumptions about the relative heights of VLP transmitters compared to licensed 6 GHz transmitters may hold some weight in the case of the typical fixed link in the U-NII-5 and U-NII-7 bands, those assumptions do not hold in the case of mobile ENG transmissions. Further, assumptions regarding body loss and the efficacy of transmit power control would require significant study. Accordingly, we urge the Commission not to take further action to authorize higher power LPI operations or VLP operations until more is known about the ability of unlicensed and licensed users to coexist in the band.

II. THE COMMISSION SHOULD DELAY CONSIDERATION OF ANY INCREASE IN POWER LIMITS FOR LOW-POWER INDOOR DEVICES UNTIL MORE REAL-WORLD DATA CAN BE GATHERED

The core legal principle at the center of any proceeding regarding expanded opportunities for unlicensed use is that unlicensed devices are prohibited from causing harmful interference to licensed operations. NAB is frankly concerned that the Commission appears to be moving away from this unyielding precedent. Notwithstanding the speculative benefits that could materialize from unlicensed services, Section 301 of the Communications Act, as implemented by Part 15 of the Commission's rules, imposes a clear prohibition on harmful interference to licensed services.⁴ Under this framework, the Commission may not weigh the potential economic benefits of increased unlicensed operation against the harm to licensed users. An unlicensed device is not permitted to cause interference to licensed services, and if it causes such interference it must cease operation. If the rules provide no mechanism to direct an unlicensed user to cease operations, the analysis must begin and

⁴ 47 U.S.C. § 301; 47 C.F.R. §15.5.

end at whether unlicensed operation at the proposed power level and operating rules poses a risk of harmful interference to licensed users of the spectrum.

In this case, the proposed changes substantially increase the likelihood of harmful interference without providing any mechanism to mitigate interference once devices have been deployed. Accordingly, the Commission should not move forward with those changes at this time.

In the original rulemaking in this docket, NAB submitted a detailed study prepared on its behalf by engineering consultants Alion Science and Technology, which demonstrated a substantial risk of interference to three separate modes of BAS operations from unlicensed operations in the band.⁵ The Commission determined, based upon unlicensed proponents' predictions about the number of devices that would be deployed in this spectrum, the activity factor of those devices and other assumptions regarding building loss and device placement, that the risk of interference at 5 dBm/MHz power spectral density EIRP was low. There is no basis for the Commission to now authorize a 3 dB higher power limit (essentially double the current limit) without empirical evidence of how these devices are deployed and used that might validate – or disprove – the Commission's numerous questionable assumptions.

The drive to proceed solely on the basis of modeling and predictive analysis carries undue and unnecessary risk. All models, no matter how rigorous, are built upon a series of assumptions. In this case, those assumptions cannot be tested or validated until devices are deployed in the market. If proponents of unlicensed operations across the band are correct, the Commission and other stakeholders will rapidly acquire more information that will provide

⁵ Letter from Rick Kaplan to Marlene H. Dortch, ET Docket No. 18-295, GN Docket No. 17-183 (Dec. 5, 2019).

an empirical basis for further action. But with no mechanism to force an unlicensed device to reduce power, change frequencies or cease operation in the event of interference to a licensed user, the harm will be irreparable if the Commission's assumptions are wrong. The entire basis for permitting use in this band must be that harmful interference *will not occur*. Under these circumstances, it is premature to authorize higher power LPI operations.

At bottom, this proceeding continues to rest on a series of contradictions. First, apparently massive amounts of new spectrum for Wi-Fi are necessary due to overcrowding in the existing bands, *but* interference is very unlikely because the Commission assumes that less than 0.5 percent of the spectrum is used on average. Second, reserving just 80 MHz of the band to ensure a clear home for mobile BAS operations in the event that the Commission's predictions were wrong might increase the potential number of devices in the remainder of the band, which would pose an unacceptable risk of interference, *but* the time is right to consider doubling the power at which those devices can transmit. Third, most devices will transmit below 5 dBm/MHz to arrive at negligible interference predictions, *but* the Commission should expeditiously authorize 8 dBm/MHz to ensure a robust marketplace for unlicensed devices.

Unlicensed service is subject to a requirement that it not cause harmful interference to licensed service. These contradictory arguments underscore the fact that nobody yet knows what the true potential for interference is, and there is no mechanism to stop it after devices reach the marketplace. One need look no further that the Commission's decade-long challenge of licensing spectrum to Ligado (formerly LightSquared) in the face of GPS objections. The Commission must proceed cautiously if it is going to open the doors to a large universe of potential interferers. Increasing the power limits by 3 dB now is premature and introduces serious risk for harmful interference that will be difficult or impossible to remedy.

III. IF THE COMMISSION AUTHORIZES VERY LOW POWER OPERATIONS IN THE 6 GHZ BAND, THOSE OPERATIONS MUST BE CONFINED TO U-NII-5 AND U-NII-7 BANDS

A. The Hidden Node Problem Makes Contention-Based Protocols Ineffective at Protecting BAS Operations

The FNPRM asks whether the Commission should require use of a contention-based protocol for VLP operations to protect licensed users.⁶ As a general matter, contention-based protocols are only effective if the device employing this technique can effectively receive signals from the device it is protecting – otherwise they are subject to the “hidden node” problem. When a receiver is capable of receiving signals from both the intended and unintended transmitter, but the unintended transmitter cannot receive a signal from the intended transmitter, contention-based protocols are ineffective. While the hidden node problem can manifest in a two-way communication system, it is nearly inevitable in a long-range one-way system as is the case in the typical BAS deployment. The probability of detecting BAS signals is virtually zero when an ENG transmitter is located far from its associated receiver, which is the case in virtually all ENG truck deployments, and a VLP device is located near the receiver. The fact that the Commission has not mandated any detection sensitivity for contention-based devices means that the probability of detection can vary at the manufacturer’s whim. Calculating the probability of detection is thus impossible.

As NAB has previously noted, the present contention-based protocol used by most Wi-Fi systems, CSMA/CA, has been ineffective in eliminating interference to BAS Channels A8 and A9, which share spectrum with 2.4 GHz unlicensed systems.⁷ As a result, those channels are largely unusable by licensed BAS systems. Similarly, in the U-NII-2 band at 5 GHz, when

⁶ R&O and FNPRM at ¶ 236.

⁷ Letter from Patrick McFadden to Marlene H. Dortch at 2-4, GN Docket No. 18-295 (March 23, 2020).

DFS features were defeated by end-users the contention-based protocol built-into Wi-Fi should have detected the FAA and broadcast RADAR systems and stopped transmitting. Instead, as the Commission is well aware, Wi-Fi systems in U-NII-2 have caused massive interference to RADAR systems and continue to do so to this day. If the contention-based protocol built-into Wi-Fi cannot detect a RADAR system radiating with millions or billions of watts of power, there is no chance it will detect a BAS system that may be transmitting at a fraction of one watt.

B. Reliance on Assumptions About Typical Use Cases Is Not Sufficient to Protect Licensed Users

The FNPRM proposes several factors to be considered in evaluating the likelihood of interference to licensed users, including body loss, clutter and typical characteristics of both receivers and transmitters.⁸ In particular, one factor the FNPRM considers is a combination of transmit power control and body loss to reduce the risk of interference.⁹ In support of this proposal, the FNPRM points to the efficacy of proximity sensors to meet the Commission's RF exposure rules.¹⁰ However, the purpose of those rules is precisely the opposite of the purpose of the rules proposed here, and thus the failure mode is entirely different. In the case of RF exposure rules, if a device incorrectly senses that it is near a body and reduces power to comply with RF exposure limits, that is a safe failure mode. In the case of VLP operations, on the other hand, if a device incorrectly senses that it is near a body and permits itself increased power to account for body loss, that *increases* the potential for harmful interference – an unsafe failure mode.

⁸ R&O and FNPRM at ¶¶ 238-240.

⁹ *Id.* at ¶ 239.

¹⁰ *Id.* at ¶ 240.

Another factor the FNPRM considers is an assumption that these devices “presumably will generally be used close to the ground” in comparison to “fixed service microwave links which are generally high off the ground and employ directional antennas.”¹¹ Notwithstanding the fact that the very next sentence acknowledges the fact that the presumptions about fixed service microwave links are not applicable to mobile BAS receivers, the assumptions in the first part of that sentence are unlikely to be enforceable or accurate in all cases. A VLP device could easily be used by a consumer on the roof deck of an apartment building and, absent enforceable rules to the contrary, could also be used on a drone or similar device several meters above the clutter.

The reality is that the Commission is speculating as to how this spectrum will likely be used, and its guesses will likely be largely irrelevant if not accompanied by enforceable rules to prevent uses that would cause harmful interference. Because the rules proposed in the FNPRM include no mechanism to enforce a shutdown if interference occurs, it is premature to allow VLP operations in the U-NII-6 and U-NII-8 bands at this time.

IV. CONCLUSION

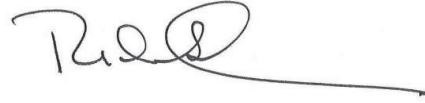
The Broadcast Auxiliary Service is essential to enable broadcasters to continue to provide the highest quality live news coverage of breaking events. We urge the Commission to delay any increase in power for LPI devices until such time as the likelihood of interference can be tested in the market. Further, we urge the Commission not to permit VLP outdoor operations in the U-NII-6 or U-NII-8 bands at this time, as such operations cannot operate without risk of interference to BAS operations in these bands.

¹¹ R&O and FNPRM at ¶ 241.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Rick Kaplan", with a long horizontal line extending to the right.

Rick Kaplan
Patrick McFadden
Alison Neplokh
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June 29, 2020