Southern Company

Southern Company Services, Inc.
600 North 18th Street
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February 6, 2020

**VIA ECFS**

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

**Re: 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: *Ex Parte* Presentation**

Dear Ms. Dortch:

Southern Company Services, Inc. ("Southern"), submits this letter in the docket of the above captioned proceeding in response to questions received during the December 11, 2019 meeting with the Office of Engineering and Technology ("OET") on the Commission's proposals for allowing unlicensed operations in the 6 GHz band.[1] Southern was asked by OET during this meeting to provide information illustrating which of Southern's 6 GHz microwave paths would be most susceptible to interference, and why, to aid OET in its analysis of the proposals for this band. In response to OET's request, Southern enlisted the expertise of Lockard & White ("L&W"), an established and experienced telecommunications engineering firm,[2] to provide an analysis of the impact of Radio Local Area Network Low Power Indoor units ("RLAN LPIs") on existing microwave links in Southern's communications network. Southern provides OET with the L&W analysis as an attachment to this letter.[3]

As the attached analysis demonstrates, RLAN LPIs operating without an effective Automated Frequency Coordination ("AFC") system will significantly impact Southern's microwave links, even in a rural, non-urban setting. This analysis also demonstrates that these microwave links would be impacted by very low power ("VLP") RLAN units as well, as such units are currently defined.

Any interference can cause operational degradation, and in the case of utility communications systems, interference is life threatening. Southern therefore again urges that any rules the Commission may adopt to allow unlicensed use of the 6 GHz band include sufficient protections to ensure the integrity and reliability of licensed 6 GHz operations.

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[1] *See* Letter from Coy Trosclair, Southern Company Services, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 (filed Dec. 13, 2019) ("Southern Dec. 13, 2019 *Ex Parte* Notice").

[2] Information about Lockard & White is available on the company's website at www.lockardandwhite.com.

[3] Lockard & White, "FCC 6 GHz NPRM Analysis for Southern Company Services," Jan. 31, 2020 ("L&W Analysis").

## I. Summary of the Lockard & White Analysis

L&W analyzed the impact of RLAN LPI operations on a sample of Southern's existing microwave links in representative urban, suburban, and lightly-populated rural environments. L&W first reviewed the various studies that have been submitted in this docket and noted the differences and apparent disagreements among these studies as to the appropriate inputs and assumptions for determining the potential for unlicensed RLAN LPI operations to cause interference to licensed 6 GHz microwave links. L&W used visual surveys (online), familiarity with Southern's microwave designs, industry standards, technical publications from ITU, Bell Labs, Institute of Infocomm Research, and books from various publishing houses to investigate and assess the assumption variables utilized in studies previously filed in this docket. As detailed in the attached analysis, L&W then applied conservative assumptions that are favorable to the position of the RLAN proponents urging unlicensed use of the 6 GHz band.[4]

L&W's process started with an assessment of the main lobe only (typically buildings within 1.4 to 1.7 degrees of the path line of sight) to calculate impact, with a plan to examine side lobes as a second effort. When it was found that both LPI and VLP RLAN units significantly impacted all links in the study when only the main lobe was considered, Southern and L&W determined that there was no need to proceed with a further assessment of side lobes at this time as a side lobe study will add interference to that already found with the main lobe due to the additional LPI and VLP RLAN units that would come within the scope of the microwave path, thus further increasing the probability of a negative impact on the 6 GHz microwave link.

As detailed in the attached analysis, the results of L&W's study demonstrate that, even with assumptions favorable to the position of the RLAN proponents, uncontrolled (*i.e.*, no AFC) RLAN LPI operations will cripple Southern's licensed 6 GHz microwave links. L&W found that although clutter and Building Entry Loss do help to mitigate the impact, these factors are inadequate for a significant number of LPI or VLP RLAN units in the main lobe regardless of distance or angle.

As stated in its December *ex parte* filing, the majority of Southern's 6 GHz microwave paths are in non-metropolitan areas.[5] The results of Southern's study with L&W demonstrate that even with very low numbers of RLAN LPI devices along its rural paths, interference into Southern's microwave links is highly probable. For example, the attached analysis shows that Southern's rural path into Webb, Alabama, shows a 72% to 91% probability of being significantly impacted by single LPI units in traditional construction homes (based on visual

[4] *See* L&W Analysis at 5.

[5] *See* Southern Dec. 13, 2019 *Ex Parte* Notice at 2-3.

inspection of the homes on this route).[6] The urban and suburban microwave paths reviewed in the attached analysis show even more significant impact from LPI operations.[7]

The attached analysis also demonstrates that VLP devices – which, as currently proposed, would be only 10db down from LPI transmit levels – would also impact Southern's microwave paths, whether in rural, suburban or urban areas. For example, a single VLP unit in the homes along the rural microwave path discussed above would impact this path with a probability of 13% to 65%[8], while the probability of impact of a single VLP unit along the urban path reviewed in this study would be as high as 82%.[9] Unless the power level for VLP operation is 30-40 dB down from LPI, interference will be seen based on the analysis conducted by L&W. Although the probability of interference from VLP operation is lower than for LPI, it is still significantly above 0%, and any interference that causes the links to experience bit error or re-synchronization will render the link unusable and significantly affect Southern's electric utility operations.

## II. The Commission Must Adopt Sufficient Protections to Ensure the Integrity and Reliability of Licensed 6 GHz Operations

Southern has previously described in the record the significant impact that interference to Southern's licensed 6 GHz microwave links would have on its electric utility operations.[10] It is critical to Southern that these links be free of any interference or RF saturation that will take away fade margin and ultimately compromise the reliability of the path. Any interference to these links can cause operational degradation, and in the case of utility communications systems, interference is life threatening.

The attached analysis, using assumptions favorable to the RLAN proponents, demonstrates that LPI and VLP units operating without an effective AFC system will significantly impact and cause operational degradation to Southern's microwave links in urban, suburban, and rural environments. Any rules the Commission may adopt to allow unlicensed use of the 6 GHz band must therefore include sufficient protections to ensure the integrity and reliability of licensed 6 GHz microwave operations.

In particular, the Commission should require AFC for all unlicensed 6 GHz operations, including all LPI and VLP operations. The Commission should also require rigorous field-testing of any AFC systems that may be proposed as a prerequisite to finalizing its rules for the 6 GHz band in order to ensure that the AFC system will work as planned.

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[6] *See* L&W Analysis at 17-20.

[7] *See id*. at 9-12 (urban) and 13-16 (suburban).

[8] *Id*. at 20.

[9] *See id*. at 12.

[10] *See, e.g.,* Comments of Southern Company Services, Inc., ET Docket No. 18-295, GN Docket No. 17-183 (filed Feb. 15, 2019) at 2-3 and 9-11.

In addition, the Commission should require all devices certified to operate in the 6 GHz band on an unlicensed basis to be equipped with a mechanism or capability (such as GPS) that would enable the location of the device to be quickly determined in the event of interference. When interference degrades or compromises the reliability and usability of a licensed microwave link, the microwave licensee must not be required to expend extensive resources and time to track down and resolve the source of interference in order to restore the link to operation.

Finally, Southern would like to re-emphasize how the 6 GHz band is uniquely suited for utility mission-critical communications over long paths where there is a lack of reasonable alternatives. Because of Southern's extensive service area and the need to communicate with facilities in very rural areas, the 6 GHz band is best suited to accommodate Southern's bandwidth and performance requirements, and deploying fiber along these routes or relocating into an adjacent band is not economically or operationally feasible.

Certain parties continue to urge the Commission to relocate all incumbent 6 GHz operations out of the upper portion of the 6 GHz band and then auction the upper 6 GHz band for licensed flexible (*i.e.*, mobile) use.[11] However, there is no indication in these proposals as to where incumbent 6 GHz systems would, or could, be relocated, other than to undefined "comparable facilities" or into the as-yet unavailable 7 GHz band.[12] As Southern has previously informed the Commission, the estimated cost of relocating to the 7 GHz band would be over $20 million for Southern's system alone.[13] In addition to these costs, any relocation would be highly disruptive to operations, including but not limited to the impact of multi-day to multi-week outages while systems are being cut over to their new channel assignments, which in turn would disrupt Southern's core electric utility operations. The Commission should therefore reject these relocation proposals.

In accordance with Section 1.1206 of the Commission's rules, this letter is being filed electronically in the above-referenced proceeding.

Respectfully submitted,

*/s/ Coy Trosclair*

Coy Trosclair
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Southern Company Services

[11] *See, e.g.*, Letter from Jennifer L. Oberhausen, CTIA, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295 (filed Feb. 3, 2020) at 3.

[12] *See, e.g.*, Comments of CTIA, ET Docket No. 18-295 (filed Feb. 15, 2019).

[13] Southern Dec. 13, 2019 *Ex Parte* Notice at 1-2.