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

In the Matter of	)	
	)	
State of North Carolina, NC Highway Patrol	)	File Nos. 0004011690, 0004011646
	)	
Request for Waiver of Section 101.143(b) of the Commission's rules	)	
	)	

ORDER

Adopted: December 10, 2010 **Released: December 10, 2010**

By the Chief, Policy Division, Public Safety and Homeland Security Bureau:

I. INTODUCTION

1. The North Carolina State Highway Patrol (NC Highway Patrol) filed two applications to increase the authorized power of a licensed microwave link that connects the Wake County 911 Dispatch Center (911 Center) to the Downtown Raleigh Land Mobile Radio system for the City of Raleigh and Wake County Public Safety Agencies (LMR Center).[1] NC Highway Patrol seeks a waiver of Section 101.143(b) of the Commission's rules in order to exceed the maximum equivalent isotropically radiated power (EIRP) specified by this rule for short paths in the 10 GHz frequency band.[2] For the reasons stated herein, we grant NC Highway Patrol's waiver request as conditioned herein.

II. BACKGROUND

2. NC Highway Patrol uses a microwave link to provide dispatch communication from the 911 Center to the LMR Center in order to ensure the safety of its police, fire and EMS first-responders.[3] NC Highway Patrol notes, however, that the redesign of a building in downtown Raleigh could potentially block the existing direct microwave path between the 911 Center and the LMR Center.[4] As a result, NC Highway Patrol states that it has recently been using a "less reliable wired solution as a stop gap measure" to ensure communication from the 911 Center to the LMR Center.[5]

3. NC Highway Patrol applied for and received authorization to modify the path of its microwave link to circumvent the obstruction.[6] Specifically, the new path will employ a passive repeater located on the top of the County Courthouse to re-route the microwave signal around the obstruction.[7] The new path is currently authorized to operate with an EIRP of 40 dBm, but NC Highway Patrol seeks to

[1] File Nos. 0004011690 and 0004011646 (collectively "Applications"), accompanied by Request for Waiver (Oct. 28, 2009) (Waiver Request).

[2] Waiver Request citing 47 C.F.R. § 101.143(b).

[3] *Id*. *See also* Notice of Return Response attached to Applications (Jan 13, 2010) at 1 (Additional Information).

[4] *See* Situation Synopsis attached to Applications (May 10, 2010) (Explanation).

[5] *Id.*

[6] *Id. See also* licenses WPVY310 and WPVY406.

[7] Explanation; Additional Information at 1.

increase the power of the new communications link to 50.9 dBm EIRP.[8] NC Highway Patrol seeks a waiver of Section 101.143(b) for the increased power, because the maximum permitted EIRP under this rule section for a path of the length deployed by NC Highway Patrol is 43.6 dBm.[9]

4. NC Highway Patrol states that it seeks the additional power in order to ensure that its microwave link maintains a minimum composite fade margin[10] of 25 dB after routing through the passive repeater.[11] NC Highway Patrol operates its microwave path using an "A side" transmitter/receiver under normal circumstances, but maintains a "B side" transmitter/receiver in the event of a failure of the primary transmitter or receiver.[12] The "A side" and "B side" equipment share a common antenna system.[13] The transmitters are operated in a "Hot-Standby" mode whereby the "B side" transmitter is switched into service if there is a hardware failure on the "A side."[14] With an EIRP of 40 dBm, the NC Highway Patrol link would operate with a 25 dB composite fade margin on the "A side" but only a 15 dB composite fade margin on the "B side" after routing through the passive repeater.[15] Consequently, NC Highway Patrol seeks to operate its link with an EIRP of 50.9 dBm to increase the composite fade margin of both the "A side" and "B side" transmitters above 25 dB.[16]

5. In support of its waiver request, NC Highway Patrol avers that a total system composite fade margin of 25 dB is the minimum level needed for a public safety center operation.[17] NC Highway Patrol notes that its area of operation is prone to fierce and sudden rainstorms; thus, additional power is needed to ensure that the link between the 911 Center and LMR Center remains operational during those severe weather conditions.[18] NC Highway Patrol states that it considered other frequency bands including the 18 and 23 GHz ranges but that it rejected these alternative frequency bands because they are insufficiently reliable during severe weather conditions.[19] As part of its application, NC Highway Patrol

[8] Additional Information at 1; Waiver Request.

[9] The path length between the 911 Center and the LMR Center using the passive repeater is 0.46 kilometers. Plugging this number into the formula detailed in Section 101.143(b) yields a maximum EIRP of 43.6 dBm. *See* 47 C.F.R. § 101.143(b).

[10] Fading is the variation (with time) of the amplitude or relative phase, or both, of one or more of the frequency components of the signal. Fading is caused by changes in the characteristics of the propagation path with time. Fade margin is a design allowance that provides for sufficient system gain or sensitivity to accommodate expected fading, for the purpose of ensuring that the required quality of service is maintained. The fade margin indicates the amount by which a received signal level may be reduced without causing system performance to fall below a specified threshold value. *See* the Alliance for Telecommunications Industry Association telecom glossary at http://www.atis.org/glossary/definitionsList.aspx?find=F&kw=0.

[11] Additional Information at 1.

[12] Waiver Request Clarification attached to Applications at 1 (Aug 2, 2010) (Clarification).

[13] *Id.*

[14] *Id.*

[15] Additional Information at 1; Clarification at 1.

[16] Additional Information at 1; Clarification at 1-2.

[17] Additional Information at 1.

[18] Waiver request; Additional Information at 2; Explanation.

[19] Clarification at 2.

also includes a showing that it coordinated its proposed increase in power with existing users.[20] Finally, NC Highway Patrol states that, if its waiver request is granted, it would be able to operate its microwave system using Automatic Transmitter Power Control (ATPC), which would allow the system to operate at higher power levels only during "conditions of extreme fade or technical issues requiring B side operation."[21]

III. DISCUSSION

6. Section 1.925 of the Commission's rules provides that to obtain a waiver of the Commission's rules, a petitioner must demonstrate either that: (i) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the present case, and that a grant of the requested waiver would be in the public interest;[22] or (ii) in view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.[23] Based on the information before us, we find that NC Highway Patrol's request warrants grant of a waiver, because it demonstrates unique or unusual factual circumstances whereby application of 101.143(b) would be unduly burdensome or contrary to the public interest, and that there is no reasonable alternative.

7. In this instance, we find that the redesign of a building in downtown Raleigh, North Carolina, constitutes a unique or unusual factual circumstance sufficient to warrant waiver relief under the Commission's rules.[24] Specifically, because of the building's redesign, NC Highway Patrol avers that it must re-route the microwave signal using a passive repeater. But in order to maintain the desired composite fade margin of 25 dB for its system at the maximum power levels permitted under Section 101.143(b),[25] NC Highway Patrol states that it must increase the EIRP of the system to make up for the additional 10 dB of loss its signal would experience passing through the passive repeater.[26] In this connection, we note that NC Highway Patrol coordinated its proposed increase in power with existing users without receiving objection from those existing users. Based on these facts, we find it would be inequitable and unduly burdensome for NC Highway Patrol to attempt to attain the desired composite fade margin while complying with the power limits specified in Section 101.143(b) of our rules.

8. In reaching this decision, we find persuasive NC Highway Patrol's assertion that a system composite fade margin of 25 dB is the minimum necessary to maintain a "reliable and robust" microwave link to ensure the safety of its "Police, Fire Department, EMS first responders and community as a whole."[27] This is particularly the case, where the fade margin must be sufficient to overcome severe weather conditions when the system may be "under heavy demand."[28] We also find persuasive NC

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[20] *See* Supplemental Showing attached to Applications (Oct 28, 2009) (Supplemental Showing).

[21] Additional Information at 2.

[22] 47 C.F.R. § 1.925(b)(3)(i).

[23] 47 C.F.R. § 1.925(b)(3)(ii).

[24] *See, e.g.,* Range Telephone Cooperative, Inc., 15 FCC Rcd 23772 (WTB PSPWD 2000) (finding that construction of a new building in the path of an existing location and its point of communication presents an unusual circumstance whereby application of the rule would be inequitable).

[25] Clarification at 1-2.

[26] *Id.* at 2.

[27] Additional Information at 1.

[28] Explanation.

Highway Patrol's alternative consideration of the 18 and 23 GHz bands, which it rejected after concluding that those bands would be unreliable for public safety operations due to their susceptibility to rain fading.[29] Consequently, we find that NC Highway Patrol has no reasonable alternative other than to operate its microwave link in the 10 GHz band because of the severe weather conditions in Wake County, North Carolina.

9. Finally, we note that NC Highway Patrol indicates that it can maintain a composite fade margin of 25 dB at power levels specified in Section 101.143(b) under normal circumstances even when re-routing its signal through a passive repeater,[30] and that it would operate the microwave system with additional power only during conditions of "extreme fade" or when the "B side" transmitter is active due to failure of the primary transmitter.[31] Consequently, we grant NC Highway Patrol's waiver request subject to the condition that it deploys ATPC to limit the transmit power of its microwave system to levels which exceed the limits specified in Section 101.143(b) only when an increase in power is needed to maintain a composite fade margin above 25 dB.

IV. CONCLUSION

10. Based on the information before us, we find that NC Highway Patrol has satisfied the Commission's waiver criteria in support of its request to operate a microwave link in excess of the power limits permitted under Section 101.143(b) for short paths in the 10 GHz frequency band. We therefore grant NC Highway Patrol's waiver request on the condition that it deploys ATPC and operates in the following manner. Under normal operating conditions, the EIRP shall be limited to 43.6 dBm except when additional power is needed to maintain a composite fade margin above 25 dB, in which case the EIRP may be increased by no more than 7.3 dB for a maximum of 50.9 dBm.

V. ORDERING CLAUSES

11. Accordingly, IT IS ORDERED pursuant to Sections 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925 of the Commission's rules, 47 C.F.R. § 1.925, that the waiver requests associated with Application File Nos. 0004011690, 0004011646 filed by the State of North Carolina, NC Highway Patrol ARE GRANTED as conditioned above.

12. IT IS FURTHER ORDERED that the Policy Division of the Public Safety and Homeland Security Bureau SHALL PROCESS application File Nos. 0004011690, 0004011646 in accordance with this *Order* and the Commission's rules.

[29] Clarification at 2.

[30] The maximum permitted EIRP under Section 101.143(b) for the path length deployed by NC Highway Patrol is 43.6 dBm. *See* n. 9, *supra*. NC Highway Patrol indicates that it can achieve a composite fade margin of 25 dB on the "A side" transmitter when operating with an EIRP of 40 dBm. *See* Additional Information at 1.

[31] Additional Information at 2.

13. This action is taken under delegated authority pursuant to Sections 0.191 and 0.392 of the Commission's rules, 47 C.F.R. §§ 0.191, 0.392.

FEDERAL COMMUNICATIONS COMMISSION

Thomas J. Beers
Chief, Policy Division
Public Safety and Homeland Security Bureau