

Xvergent Statement in Support of Experimental License

Pursuant to Section 5.63(c)(1) of the Commission's Rules, Xvergent provides this statement in support of its application for an experimental license to conduct a market trial, as defined in Sections 5.5 and 5.602, using spectrum in the 3550-3650 MHz band transmitting from designated locations in the Wilkes-Barre/Scranton, Pennsylvania. Xvergent requests a license term equal to the shorter of (a) two (2) years from grant of this application, or (b) Xvergent's grant of authority from a Spectrum Access System ("SAS") and Environmental Sensing Capability ("ESC") to operate the authorized equipment and facilities on a General Authorized Access ("GAA") basis.

Overview

Xvergent is a fixed wireless broadband provider that holds a nationwide non-exclusive 3650-3700 MHz service license (Call Sign WQKR637). Xvergent currently provides broadband service in the Wilkes-Barre/Scranton, Pennsylvania, an area that is rural, very hilly and heavily foliated. In addition, Xvergent's affiliated company, SWG Inc. ("SWG") is a major distributor of equipment for the fixed wireless broadband industry.

Xvergent has deployed LTE technology in the 3650-3700 MHz band using Telrad equipment. The Telrad LTE equipment uses software-defined radios that can be turned to operate in the 3550-3650 MHz band and, ultimately, configured to operate with the SAS and ESC that are under development. Based on its experience, Xvergent believes that LTE technology deployed in the 3550-3700 MHz band offers the best combination of throughput, propagation, cost and equipment to deliver high-quality broadband service to its subscribers and others in the target markets that lack access to competitive broadband services.

In this trial, Xvergent will test the Telrad LTE equipment on 20-megahertz channels in a challenging topographic and geographic environment. Channels of this size are not available in the 3650-3700 MHz band. Although the larger channel size is expected to improve throughput and speed, the degree of improvement is unknown. Xvergent also plans to experiment with various speed and pricing plans to assess consumer acceptance of the service. If the trial is technologically successful and beneficial to consumers, Xvergent will realize significant cost savings and improved performance. In addition, SWG can learn valuable information that it can share with its fixed wireless broadband provider customers so that they can make better decisions about equipment, deployment, network architecture and cost models.

The trial will provide Xvergent and SWG's customers with information to help make its future expansion and network investment plans. Assuming the trial is successful, Xvergent expects to utilize a combination of Priority Access Licenses ("PAL") and GAA "license by rule" spectrum across the entire 150 megahertz of 3550-3700 MHz spectrum. However, to date, there is no Part 90 certified equipment that incorporates the functionality needed to comply with new Part 96 requirements, partially due to the fact that there is no certified SAS and ESC, and the technical specifications for the SAS and ESC are still under development.

SWG, through its membership in the Wireless Internet Service Providers Association, has supported the creation of the Citizens Broadband Radio Service (“CBRS”). SWG believes that the *CBRS Order*,¹ along with the ongoing development of the SAS and ESC, represents a positive change in spectrum management policy, and will eventually result in extremely efficient and widespread use of this 150 megahertz of spectrum for both small cell technologies for mobile wireless broadband and higher power technologies for fixed wireless broadband in rural and underserved locations.

In order to determine the financial and technical viability of the CBRS band and assess consumer acceptance at various speeds and price points, Xvergent seeks an experimental license to use spectrum in the 3550-3650 MHz band in the Wilkes-Barre/Scranton, Pennsylvania area, transmitting from the sites identified in this application. These areas include significant rural areas where consumers lack choice in broadband access. Xvergent is using all available 3650-3700 MHz spectrum in these areas such that further deployment in that band would result in harmful self-interference. Xvergent plans to use Telrad equipment on an experimental basis to determine the market potential resulting from an additional 100 megahertz of low-band spectrum and the effects of wider 20-megahertz channels, and as a testbed for SWG to share important information to its fixed wireless broadband customers so they can make more informed business decisions. In sum, this experiment will inform Xvergent’s business, investment, technology and deployment decisions as it plans to expand and upgrade its broadband network, and will inform SWG’s customers as well.

Description of Program

Because the Commission has not yet certified equipment for use with the SAS or the ESC in the CBRS band, Xvergent plans to use Telrad equipment certified by the FCC for use in the 3650-3700 MHz band that is re-tuned to the 3550-3650 MHz band. Power limits and out-of-band emission limits will conform to the Part 96 rules for Category B CBSDs that the Commission adopted in the *CBRS Order* and the Order on Reconsideration and Second Report and Order.²

Xvergent will conduct the experiment in its existing network area. Xvergent has access to and is transmitting on other frequencies from existing towers and operation in this area with personnel on site to monitor construction and operation, to ensure that there will be no harmful interference to Incumbent Access users, and to remedy harmful interference in the unlikely event it occurs. Commission records also show that there are no Fixed Satellite earth stations in the

¹ See *Amendment of the Commission’s Rules with Regard to the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (“*CBRS Order*”).

² See *Amendment of the Commission’s Rules with Regard to the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, 31 FCC Rcd 5011 (2016) .

3600-3650 MHz band operating within approximately 50 kilometers of the trial location.³ There appear to be no ground-based radar in or near the planned trial area that would require ESC or coordination with incumbents, and the area where the trial will be conducted lies outside of the coastal exclusion zone.⁴

Under the market trial aspect of the experiment, Xvergent plans to test different broadband speeds and price points to determine the utility and value of the CBRS as it relates to consumer take rates and network performance, both for its own operations and those of SWG's fixed wireless broadband operator customers. Over time, Xvergent may test with different equipment as it becomes available. Consistent with the market trial requirements of Section 5.602(d), Xvergent will own the CBSD and End User Device equipment, and will not transfer ownership to trial participants. Xvergent seeks authority to deploy across the entire network and serve up to 1500 end users, which it believes is the minimum quantity necessary to conduct the two-year trial proposed in this application due to the need to measure performance and the integration of the Telrad equipment with the SAS and ESC.

Xvergent plans to conduct its trial in two phases. In the first phase, Xvergent will deploy with equipment certified for use in the 3650-3700 MHz band in accordance with the technical showing of this application. In the second phase, which will begin when SAS and ESC testing is viable with at least one party, Xvergent will incorporate experimental SAS/ESC integration of equipment into the trial.

Objectives of Experimental Program

During the trial, and prior to the certification of a SAS and ESC, Xvergent will comply with the power levels in Section 96.41 as they apply to End User Devices and Category B CBSDs. Xvergent has also carefully designed its experimental system to minimize signal that could extend across the boundary of the coastal exclusion zone or to areas where harmful interference to earth stations would be expected to occur. At the conclusion of the requested experimental license term, Xvergent will either transition to Part 96 GAA if equipment is certified and authorized under GAA rules or, if not, cease operation in 3550-3650 MHz. Xvergent hopes that the equipment and SAS/ESC development can be accelerated through the information generated by the market trial.

In addition to the technical objectives, Xvergent will test to determine the value and utility of PALs, which necessitates charging for the service at varying price points and

³ See *Amendment of the Commission's Rules with Regard to the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, 27 FCC Rcd 15594 (2012), at Appendix A. The Call Signs are E980493 at Catawissa, PA and KLA444 at Roaring Springs, PA. To the extent necessary, Xvergent will accept a condition on its experimental license that would require it to notify FSS licensees operating in the 3550-3700 MHz band within a 20 kilometer radius of the locations from which experimental operations will be conducted.

⁴ See Letter dated from Paige R. Atkins, NTIA, to Julius P. Knapp, FCC, GN Docket No. 12-354 (dated March 24, 2015), at Enclosure 1.

performance levels. The trial will also provide Xvergent with information that may be useful in bidding on PALs.

The experiment will examine the impact of the following rules on potential future commercial deployments.

Section 96.15 - Validate ability to comply through dynamic frequency changes across a geographically clustered collection of CBSDs, planned and executed within 300 seconds of a simulated command to vacate an occupied channel.

Section 96.17 – Validate propagation model’s ability to predict co-channel interference, blocking, and OOBE to comply with protections of existing Incumbent Access users. This will also be useful to assess protection of PAL users by GAA users.

Section 96.21 - Validate propagation model’s ability to predict co-channel interference, blocking, and OOBE to comply with protections of grandfathered FSS earth stations and any Grandfathered Wireless Broadband Protection Zones.

Section 96.25 – Validate propagation model’s ability to predict compliance with PAL Protection Areas.

Section 96.41 – Determine the appropriate power levels for CBSD and End User Devices to both comply with this section and achieve desired coverage and performance. The aggregate RMS power level RSS and PAPR requires measurement validations in a real world environment where CBSD and End User Device density is consistent with intended long term use of the band. Propagation models must be tuned and validated to accurately predict compliance. Power level control of the equipment must be tuned so that the CBSD and End User Device transmit at the lowest power levels possible to meet performance objectives, while complying with the prescribed limits.

Section 96.53 – Develop methods to detect interference at the CBSD and End User Device from other GAA and PAL users so it can be reported to the SAS and ESC.

Contribution to the Radio Art

In accordance with Section 5.63(c)(1), Xvergent and SWG expect that the market trial will contribute greatly to the radio art. The CBRS is a new service in which commercial and Federal uses will share a spectrum band, with use governed by an SAS and ESC. It has been characterized as a test-bed for innovation and as a paradigm shift in spectrum management. In connection with its market trial, Xvergent expects to learn a significant amount of information about equipment capabilities and limitations, interference protection and mitigation, customer acceptance at various speeds and price points, and integration of its service and equipment with the SAS and ESC. This will be extremely useful not just to Xvergent, but also to SWG’s fixed wireless broadband operator customers. Because the equipment manufacturer, Telrad, also will have access to Xvergent’s network, Telrad also will gain important information that will improve

equipment performance and development. To the extent permitted by SAS and ESC administrators and equipment providers, Xvergent will share the results of its market trial with the Commission.

Notice to Consumers

As required by Section 5.602(e), all end users will be advised at the commencement of the trial that service is being provided on a trial basis, that any non-approved devices are for testing only and that all equipment must be returned at the end of the trial period. Xvergent further acknowledges that it will retrieve the end user devices from the users at the end of the trial. In particular, all end users will be notified that the service they will be receiving is being provided in part or in whole under experimental authority, and that as a condition of the experimental license, Xvergent may be required at any time, without prior notice, to cease operations in the 3550-3650 MHz band. In addition, Xvergent acknowledges and will notify users that all customer premise equipment authorized under the experimental license remains the property of Xvergent, and must be collected or rendered inoperable at the conclusion of the trial. At the end of the trial, Xvergent will either: (1) shut off the service immediately, stop billing users for the service and post a public notice at www.xvergentnetworks.com, and collect or render all customer premise equipment inoperable, or (2) change the frequency and operating parameters of some or all of the customer premise equipment that is part of the trial to parameters authorized under Part 90, Subpart Z of the FCC rules (which may materially impact network capacity, performance, and quality of service), post a public notice to www.xevergentnetworks.com, and allow users to opt out of the modified service offering with no further obligation to pay for the service.