

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)
Spectrum Needs for the Implementation of the) WT Docket 11-79
Positive Train Control Provisions of the Rail)
Safety Improvement Act of 2008)

To: Chief, Wireless Bureau

Reply Comments of Full Spectrum Inc.

Full Spectrum Inc. (Full Spectrum) submits these reply comments in the Commission's proceeding dealing with the spectrum needs for Positive Train Control, or "PTC."

By way of background, Full Spectrum is the developer of "FullMAX", a state of the art, advanced, internet protocol (IP) based, end-to-end, wireless broadband system which provides both mobile and fixed private wide area data communications for Mission Critical Industries. FullMAX is an enhanced version of the worldwide Mobile WiMAX standard (IEEE 802.6e-2005) designed for maximum wide area coverage for intelligent infrastructure networks. In contrast to other 4G technologies, FullMAX uses any allowable licensed frequency from 40 MHz to 958 MHz. By using low band VHF/UHF frequencies, FullMAX provides mission critical industries maximum wide area coverage at very low infrastructure costs (between 1/20th and 1/50th of the infrastructure costs of other 4th generation systems). FullMAX remote radios are equipped with both serial and Ethernet interfaces and support a wide range of legacy and advanced network protocols (TCP / IP, SCADA, etc.). Each radio includes a GPS chip to enable real time transmission of the remote radios coordinates for automatic vehicle location. The FullMAX solution enables highly reliable, scaled deployments of mission critical applications for both mobile and fixed data.

Full Spectrum's end-to-end system is designed on a fully-programmable software defined radio (SDR) platform (FPGA, DSP, General Processors, etc.) capable of operating in any frequency band between 40 MHz and 958 MHz in channel sizes from as little as 166 kHz up to 5 MHz in width. This differs from consumer technologies that rely on defined chipsets (e.g. LTE, WiMAX) in large channel sizes (5 MHz, 10 MHz) at very low transmit power.

Mission critical organizations are in the process of transitioning to intelligent networks to manage and control their critical dispersed assets and communicate with their remote mobile workforce (smart grids, smart pipes, etc.). Full Spectrum's FullMAX broadband wireless solution was designed specifically to meet the mobile and fixed data communication needs of these types of organizations. The initial design for FullMAX came from inputs Full Spectrum received directly from a number of electric and natural gas utilities throughout the United States starting as early as 2005. Information was provided by IOUs, electric cooperatives and municipalities which require private wide area networks for the implementation of smart grids.

FullMAX offers the ability to handle legacy SCADA applications while supporting newer, higher bandwidth, private, fixed and mobile data applications including remote control and monitoring of 1) voltage regulators, 2) capacitor banks, 3) reclosers, 4) switches, 5) voltage sensors and any other device using serial or IP protocols. For mobility, the system allows remote utility workers the ability to access the company intranet for downloading of GIS information, email and remote VoIP access. Furthermore, each FullMAX MS4000 mobile radio includes a GPS chipset that provides real time coordinates to the utility's central office for workforce optimization. By leveraging 4th generation IP protocols and quality of service (QoS) features, the same FullMAX system is capable of supporting mission critical smart grid applications for distribution automation and smart meter backhaul. This includes the ability to

meet new Critical Infrastructure Protection (CIP) rules as defined by the North American Electric Reliability Council (NERC).

Full Spectrum is actively working with a number of utility companies both domestically and internationally to deploy FullMAX systems. In the US, this includes electric cooperatives, municipalities and investor owned utilities (IOUs) operating in Montana, Wyoming, Virginia, Texas, North and South Carolina, South Dakota and the District of Columbia.¹ Full Spectrum has a number of projects pending with utilities that have expressed an interest in utilizing the 216-220 MHz band for their smart grid deployments.

Full Spectrum notes that a number of parties have requested the Commission set aside specific amounts of spectrum in the 216-220 MHz band for the railways' implementation of PTC. Full Spectrum requests that the Commission carefully consider that other mission critical organizations, such as electric utilities and natural gas distribution companies, also have shown significant interest in using the 216-220 MHz band. Full Spectrum believes the Commission should give such organizations equal opportunity to access spectrum in the 216-220 MHz band without favoring one industry over another through spectrum set asides. Full Spectrum's customers have every interest in acquiring these frequencies through the auction process as soon as it moves forward. For this reason, Full Spectrum supports moving forward with an auction at the soonest practicable date. Full Spectrum believes last year's postponement of the 218-219 MHz auction has hampered the development of that band and has hindered the deployment of smart grid technology for the utility industry. The auction of the 218-219 MHz band is critical for many of its customers. Previously, Full Spectrum had informed its customers of the tremendous opportunity the auction offered to obtain spectrum in

¹ As part of its effort to work with utility companies, Full Spectrum is a lessee of frequency segments A B in the 218-219 MHz Service for the Washington DC MSA.

the remaining MSAs and RSAs. Many of these customers have already been allocated millions of DoE funds for smart grid deployments. The delay of the auction has stalled these customer deployments delaying our business plan as well as the implementation of smart grid functionality.

Full Spectrum's dealings indicate that while some utilities have shown a strong interest in using 218-219 MHz spectrum, the full service area of their operations may not be covered by the existing licenses available in the secondary market, creating complications and uncertainties as to planning a buildout of a system using spectrum they otherwise find attractive. Full Spectrum thus urges the Commission not to adopt new spectrum set asides or technical rules – a process that could take years – and proceed with the next auction now in a manner allowing all industries to participate on equal footing.

Respectfully submitted,



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