Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Request of PTC-220, LLC for Waivers of Certain 220 MHz Rules	)	**WT Docket No. 08-256**
	)	
	)	
Construction Progress Report	)	

To: Chief, Wireless Telecommunications Bureau

PTC-220, LLC
CONSTRUCTION PROGRESS REPORT

I. INTRODUCTION

PTC-220, LLC ("PTC-220") submits this Construction Progress Report to satisfy the requirements of paragraph 16 of the Memorandum Opinion and Order ("*Waiver Order*") adopted by the FCC on June 25, 2009.[1] This Report details the progress made during the past six months in implementing the Systemwide Build-out Plan (the "Build-out Plan") submitted by PTC-220 on November 1, 2010, in the above-referenced docket. The Build-out Plan explained how PTC-220's 220 MHz licenses ("Licenses") would be used in deploying a nationwide positive train control ("PTC") system, as required by Federal statute. The construction of the Licenses will be undertaken in large part by each of PTC-220's member railroads,[2] although PTC-220 will also coordinate construction activities by non-member railroads.

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[1] *Request of PTC-220, LLC for Waivers of Certain 220 MHz Rules*, Memorandum Opinion and Order, 24 FCC Rcd 8537 (2009).

[2] PTC-220's members are BNSF Railway ("BNSF"), Canadian National Railway ("CN"), Canadian Pacific Railway ("CP"), CSX Transportation ("CSX"), Kansas City Southern Railway ("KCS"), Norfolk Southern Railway ("NS"), and Union Pacific Railroad ("UP").

II. SITE BUILD-OUT ACTIVITY

Since its last Construction Progress Report filed November 1, 2012, PTC-220's member railroads have continued to build new or prepare existing base station sites, and install base station radios. As before, preparatory work at existing sites includes, among other things, coverage predictions, design and installation of antenna systems, upgrading of site power systems, site pre-wiring, and backhaul design. The table below indicates the progress to date for each PTC-220 member railroad, by State, for base station site preparation and base radio installations. Some of the installed radios are being actively used in various field testing programs, while others are currently powered off, awaiting final frequency coordination.

State	BNSF		CN		CP		CSX		KCS		NS		UP	
	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio
AL	4	4					21				17	17		
AR	5	5											13	
AZ	20	20											11	
CA	39	39											36	2
CO	8	8											5	
FL							39	5						
GA							17	1			31	18		
IA	22	22			24								14	
ID	5	0											2	
IL	22	16			4		17	1			4		28	1
IN							43				9			
KS	28	26											8	1
KY							68	1			8			
LA	5	5	8						26		2	2	10	
MA							13							
MD							25	1			2	1		
MI			6				20							
MN	24	24			4									
MO	27	23			4				3				17	
MS	3	3	4						15		10	10		

State	BNSF		CN		CP		CSX		KCS		NS		UP	
	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio
MT	49	19												
NC							29	22			15	1		
ND	36	17			10									
NE	20	20											33	
NJ							2							
NM	15	15											5	
NY					14		44	1						
OH							59	8			6	5		
OK	25	19												
OR	1	1											6	
PA					9		17				7	3		
SC							19	4			15	9		
SD	1	1												
TN	2	2					38	1			25	19		
TX	38	38							21				64	
UT													5	
WA	54	43											4	
WI			21										2	
WV							86							
WY													18	
VA							50				19			
Total	**453**	**370**	**39**	**--**	**69**	**--**	**607**	**45**	**65**	**--**	**170**	**85**	**281**	**4**

Totals	
Site Prep	**Radio**
1684	**504**

In addition to the base station deployment programs, each member railroad is also building fixed wayside sites and installing radios, as well as installing mobile radios in their locomotive fleets.

Environmental Evaluation Process Impacts Tower Site Construction

While PTC-220 continues to make progress on construction of both base and fixed wayside stations, one threat to the pace of build-out activity that has recently come into sharp focus involves compliance with Section 106 of the National Historic Preservation Act (NHCP) and its implementing rules. These rules require an extensive environmental evaluation to determine if a proposed new tower is likely to have "a significant effect upon the quality of the human environment," and thus require further environmental processing by the FCC.[3] The environmental evaluation, in turn, requires the PTC-220 member railroad to notify and coordinate with the FCC, other federal agencies, State officials, and representatives of Native American tribes on a site-by-site basis for each new tower they propose to build. Where a new tower requires further environmental processing because, for example, it will be located in a floodplain or in a flight path, the PTC-220 member railroad must complete an extensive application process that requires public notice and site-specific approval by the FCC.

The number of new wayside antenna sites required for PTC has the potential to overwhelm any current processing capabilities of the FCC, Native American tribes, and state historic preservation offices, resulting in delays to PTC site construction. For this reason, PTC-220 is working closely with the FCC and the Federal Railroad Administration ("FRA") to streamline the environmental review process to the extent possible. For example, PTC-220 representatives have met with FCC staff to provide information about its nationwide PTC deployment requirement and to discuss the challenges occasioned by its scale. That has led to follow-up conversations and mutual efforts to streamline the process. In the meantime, PTC-220 has committed to sending representatives to environmental compliance training for FCC

[3] *See* 47 C.F.R. §§ 1.1305-1.1307.

licensees in May 2013, which will include training by staff from the FCC, the Advisory Council on Historic Preservation, the National Conference of State Historic Preservation Officers, and the National Conference of Tribal Historic Preservation Officers, as well as a special session to address railroad-specific issues and concerns.

III. TTCI ACTIVITIES

As mentioned in previous filings, PTC-220 has engaged Transportation Technology Center, Inc. (TTCI) for a number of technical support services related to PTC. Among these services is the RF network design of congested areas, and management and coordination of PTC-220's spectrum holdings.

One of TTCI's first assignments was to analyze the spectrum needs in several key rail centers to determine if additional spectrum is necessary in any of these areas. This work is nearly complete, with either final or draft reports delivered for Chicago, Los Angeles, Kansas City, Saint Louis, New Orleans, and Minneapolis/Saint Paul. Work on Toledo and the New York/Newark area is still in progress. With the completion of these last two analyses, PTC-220 feels that it will have a good picture of the need for additional spectrum to support PTC across the country, and the spectrum needs phase of TTCI's work will be complete. In the next phase, which has already begun, TTCI will work on the actual network designs for these and other congested areas.

TTCI applied for and won an FRA grant to undertake RF network designs for three cities, and this funding will be applied to work in the Chicago, Kansas City, and the Dallas-Ft Worth areas. This work will run in parallel with PTC-220 funded work in other cities, yet to be named.

In the area of spectrum management and coordination, TTCI's Frequency Application Management System (FAMS) is now largely in place. FAMS will hold and manage information

about PTC frequency and time slot plans across the nation, and also automate the flow of this information from the RF planning tools to the databases that hold the data. Basic FAMS functionality is in production, with additional functionality scheduled for future upgrades.

IV. EQUIPMENT DEVELOPMENT

The four radio models[4] developed by Meteorcomm LLC are now in full production by two manufacturers. The radio hardware designs are proving to be very stable, with no known serious bugs. Current software supports all basic PTC functionality, and new functions and features will be added through a program of scheduled software releases. As previously reported, all radios have Part 90 certification, and Meteorcomm is now actively pursuing Part 80 certification to accommodate users who might choose to operate on AMTS spectrum below 220 MHz.

V. FIELD TESTING

Most PTC-220 member railroads have ongoing field test programs designed to validate preliminary network designs and to assess the performance of over-the-air protocols under field conditions. A number of railroads are engaged in drive testing in selected areas, which compares predicted to actual signal strengths and message error rates. These tests are invaluable in fine-tuning the RF prediction models to achieve the best accuracy. They also help to gauge the benefit of certain RF technologies, such as antenna diversity on the locomotives. PTC-220 is in the process of contracting for a large-scale drive testing effort that will provide data to optimize

[4] The four radio models are for installation in: locomotives, wayside sites, and base station sites with either 24- or 48-volt power supplies. The FCC IDs for these radios are BIB63010, BIB63020, BIB63030-24, and BIB63030-48.

prediction tools over a wide variety of terrain types. The field testing programs continue to be instructive, and will increase in scale over the coming months.

VI. SPECTRUM

With TTCI's spectrum needs analysis work nearing completion, the emerging picture is that PTC-220's spectrum will be sufficient to support PTC in most areas, provided that PTC-220's pending waiver request, described below, is granted. Chicago is known to be one exception, and a purchase of additional spectrum in that area should be finalized soon. The only remaining significant uncertainty on spectrum needs is in the New York/Newark area, but TTCI's analysis of this area will be available later this year.

On February 1, 2013, PTC-220 filed a request for waiver of certain FCC rules which, *inter alia*, limit power and antenna height of transmitters in the 221-222 MHz band.[5] As outlined in the filing and in two previous presentations to the FCC, the waivers are necessary to allow full and efficient use of PTC-220's licenses for PTC. Without the waivers, PTC-220 would likely need to acquire additional spectrum in many areas, and would have less spectrum to lease to non-member railroads. Comments and reply comments filed in response to the waiver request were all positive except for those from the National Rural Telecommunications Cooperative ("NRTC"). PTC-220 filed reply comments, which it believes should adequately address NRTC's concerns.

PTC-220 continues to have discussions with a number of non-member railroad entities interested in leasing spectrum for their own PTC deployment. Of the approximately 19 ongoing discussions, 12 have progressed to the point of having a non-disclosure agreement ("NDA") in

[5] *See* Request of PTC-220, LLC for Waivers of Sections 90.729(b) and 90.723(f) of the Commission's Rules, WT Docket No. 13-59 (filed Feb. 1, 2013).

place. Currently, two long term leases have been executed, in addition to three short term leases for testing purposes.

One other spectrum issue PTC-220 is addressing is that of international agreements regarding the use of 220 MHz spectrum in Canadian and Mexican border areas. In a meeting with the Commission's International Bureau in March of this year, PTC-220 pointed out that some of the provisions in these agreements are not conducive to PTC operation, and that existing or future waivers of FCC rules may not apply in border areas. PTC-220 is currently working on proposed changes to the Interim Sharing Agreement with Canada, and is conducting further research with respect to the agreement with Mexico.

VII. NETWORK PLANNING TOOLS

As described in previous reports, PTC-220 engaged Meteorcomm to design a custom extension to the commercial Mentum Planet RF prediction tool to support PTC protocols. This work ended in March 2013 with the delivery of the tool, called ITCnet[6] Planning Module ("IPM"). This tool optimizes the frequency and TDMA time slot plans for PTC networks, and interfaces directly with the FAMS application developed by TTCI. PTC-220 has entered into a follow-on contract with Meteorcomm for development of some additional features for IPM, as well as for ongoing support of the product.

The Mentum Planet RF prediction tool with the IPM module is being offered to both PTC-220 members and non-members in a hosted environment supported by Mentum under contract to PTC-220. Lessees of PTC-220 spectrum are provided access to the tools pursuant to

[6] ITCnet is the name of the over-the-air protocol used by PTC. "ITC" stands for Interoperable Train Control.

a provision in the lease. PTC-220 is also working on a way for railroads in the process of negotiating for a lease to obtain some kind of provisional access to the tools.

The hosted environment makes possible the "stitching" together of independent but geographically adjacent network design projects so that each design takes into account all adjacent projects. For this reason, it is important that all projects be implemented in a consistent way. PTC-220 has developed standards for the building of projects, and is working with Mentum to provide training classes for users of the hosted applications.

VIII. CONCLUSION

PTC-220 continues to make substantial and steady progress in executing its Build-out Plan. Although challenges associated with the massive scope of the undertaking are being felt, PTC-220 remains cautiously optimistic that its construction deadline can be met, assuming that its pending request for waiver of Sections 90.729(b) and 90.723(f) of the Commission's rules is granted.

Respectfully submitted,

/s/ Michele C. Farquhar

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