

**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 Federal Communications Commission (“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

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

member railroads,² although PTC-220 will also coordinate construction activities by non-member railroads.

II. SITE BUILD-OUT ACTIVITY

Since the May 2014 Report, 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												
AL	4	4					41	27			29	29		
AR	5	5							9				9	19
AZ	20	20											7	4
CA	39	39											39	31
CO	15	15											7	3
FL							39	15			1	1		
GA							23	17			39	39		
IA	25	23			23	9							5	13
ID	5	5											7	14
IL	32	28	31		4	2	17	9			23	23	10	28
IN			6				43	29			14	14		
KS	38	35							3				17	12

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”).

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
KY			2				68	42			13	13		
LA	5	5	8	7			1	1	29		2	2	14	4
MA							13	10						
MD							25	6			2	2		
MI			10				20	0						
MN	29	25	6		4	1							1	
MO	30	30	12		3	3			7		8	8	1	18
MS	3	3	4				3	3	6		11	11		
MT	59	53												
NC							39	34			16	16		
ND	50	41			11									
NE	32	31											0	34
NJ							2	2						
NM	16	16											8	4
NV													25	0
NY					15	2	46	40						
OH							59	31			9	5		
OK	26	26							6				10	0
OR	1	1											22	6
PA					9		17	8			12	12		
SC							19	19			20	20		
SD	5	1			2									
TN	2	2					38	29			25	25	1	
TX	44	39							18				44	53
UT													17	1
WA	55	54											5	3
WI			24										3	
WV							86	49						
WY	1	1											8	14
VA							50	20			19	19		
Total	541	502	103	7	71	17	649	391	78		243	239	260	261

Totals	
Site Prep	Radio
1945	1417

In addition to the base station deployment programs, PTC-220 member railroads are also installing mobile radios in their locomotive fleets.

Historic Review Process Impact on Wayside Pole Construction

Although PTC-220 continues to make progress on the construction of its base stations, its member railroads have only recently been able to begin installation of their wayside stations, due to challenges arising from compliance with Section 106 of the National Historic Preservation Act (“NHPA”) and its implementing rules. As the FCC is aware, these rules require an extensive environmental and historic 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 processing by the FCC.³ The historic review evaluation, as interpreted by the FCC, 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.

In May 2013, the FCC determined that site-by-site processing of the over 22,000 new wayside stations required for national PTC deployment would overwhelm the capacity of the Tower Construction Notification System (“TCNS”) process, including the ability of the Commission, Tribal Nations, and State Historic Preservation Officers (“SHPOs”) to conduct review. Consequently, at the FCC’s request, PTC-220 members suspended the submission of applications for historic preservation review processing, effectively putting all PTC infrastructure on the railroad rights of way on hold.⁴ Although this suspension technically

³ See 47 C.F.R. §§ 1.1305-1.1307.

⁴ With the permission of the FCC, since May 2013 some railroads have submitted some requests for approval using the established TCNS process for the review of PTC base station towers. On January 8,

applied only to PTC wayside poles, due to the uncertainty emanating from the discussions regarding the appropriate procedures to be followed regarding the environmental and historic review process in general, many PTC-220 members also temporarily halted construction of base station sites out of an abundance of caution.

On May 16, 2014, after months of consultation and negotiation, the Advisory Council on Historic Preservation (“ACHP”) issued a Program Comment,⁵ which provides an optional alternative process to complete Section 106 review for the deployment of PTC infrastructure.⁶ Although the Program Comment was immediately effective on adoption,⁷ its implementation was dependent on clarifying guidance from the FCC. The Commission initially issued its Program Comment Guidance on June 6, 2014, and has subsequently revised and updated this guidance three times, reflecting the complicated nature of this process.⁸

2014, the FCC reopened TCNS on a limited basis in a Beta test format for the filing of PTC-related wayside facilities applications batched in groups of no more than twenty contiguous sites located within a single county in areas that were subject to discussion with Tribal Nations at meetings in Rapid City, South Dakota and Tulsa, Oklahoma in fall 2013. *See* Letter from Jeffrey Steinberg, Deputy Chief, Spectrum and Competition Policy Division, Wireless Telecommunications Bureau, Federal Communications Commission to Timothy Strafford, Assistant General Counsel, Association of American Railroads at 1-2 (Jan. 8, 2014). The PTC Program Comment discussed below effectively supplanted the Beta test process.

⁵ Program Comment to Tailor the Federal Communications Commission’s Section 106 Review for Undertakings Involving the Construction of Positive Train Control Wayside Poles and Infrastructure, *available at* https://apps.fcc.gov/edocs_public/attachmatch/DA-14-680A2.pdf (last accessed Oct. 7, 2014).

⁶ *See* 36 C.F.R. § 800.14(e). A Program Comment allows a federal agency to request the ACHP to comment on a category of undertakings in lieu of conducting individual Section 106 reviews. *See* “Program Alternatives,” ACHP, www.achp.gov/progalt/ (last accessed April 15, 2013).

⁷ Wireless Telecommunications Bureau Announces Adoption of Program Comment to Govern Review of Positive Train Control Wayside Facilities, WT Docket No. 13-240, *Public Notice*, DA 14-680 (rel. May 19, 2014).

⁸ *See* Positive Train Control Program Comment Questions and Answers, http://wireless.fcc.gov/ptc/ptc_q_a4.pdf (last updated Sept. 26, 2014).

Although the railroads are currently employing the Program Comment process to enter PTC wayside poles into TCNS for Section 106 review, the prior delays significantly delayed the PTC construction and implementation process. As a result of these delays, PTC-220 railroads have only recently been able to begin critical testing of PTC systems, and initiate the training and certification of railroad employees on PTC equipment that must take place before general deployment.

The Commission's environmental rules have also posed a further challenge to the approval of PTC wayside poles for deployment. These rules require that applicants file an Environmental Assessment ("EA") if construction of facilities may significantly affect the environment.⁹ After a series of consultations, PTC-220 and the Commission developed an expedited process for filing EAs, which is now in place. However, the PTC-220 railroads have only recently been able to submit EAs to the FCC for its review, and the process of preparing and submitting several thousand EAs will further delay PTC wayside pole deployment.

Since May, PTC-220 railroads have met repeatedly with the FCC to work through many details of implementing the new Program Comment and the EA submission process, and currently hold biweekly meetings to discuss ongoing issues and any concerns with the process. PTC-220 appreciates the Commission's efforts to expedite the process and to resolve any problems quickly.

⁹ 47 C.F.R. § 1.1307(a). If an EA is required, a railroad may not begin construction until the Commission issues a Finding of No Significant Impact ("FONSI"). 47 C.F.R. § 1.1308(d).

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 radio frequency (“RF”) network design of several congested urban areas, and management and coordination of PTC-220’s spectrum holdings.

TTCI has continued with the development of full RF network designs for dense urban areas. The designs for the Dallas/Fort Worth and Los Angeles areas have been completed but are currently being reviewed in light of recently-released propagation models that more accurately represent the actual radio system propagation. The RF designs for the Chicago and Kansas City areas, funded by FRA, are in the final stages of data collection and preparation for RF simulation, and are planned to be completed by the first quarter of 2015. For the PTC-220-funded design of the New Orleans area, RF simulations are scheduled to begin during the last quarter of 2014. This work is planned to be completed by the first quarter of 2015. The projects for the Minneapolis-St. Paul and Toledo areas are awaiting drive testing data required for RF simulation.

TTCI was recently awarded funding from FRA to develop the RF network design for the Northeast Corridor (“NEC”). The project encompasses the core areas of Major Trading Areas (“MTAs”) 01, 09 and 10, where commuter and passenger lines as well as freight railroads operate. These areas differ from other congested areas, as commuter and passenger lines will operate their trains under the control of the ACSES PTC system, which uses a different air interface technology than the ITC radio system being deployed by the freight railroads, although it will operate within the same frequency band. The NEC project will analyze various issues that may arise as a result of deploying both ACSES and ITC within the 217-222 MHz frequency

range, such as radio desensitization due to proximity, spectrum sharing among the different radio systems, and tracks operating simultaneously under dual control (ACSES and ITC-ETMS).

In the area of spectrum management and coordination, TTCI's 220 MHz Frequency Application Management System ("FAMS-220") is now in operation. FAMS-220 holds and manages information about PTC frequency and time slot plans across the entire nation, and also automates the flow of this information from the RF planning tools to the databases. The TTCI Frequency Coordination Office staff continues to support the FAMS-220 system and develops software updates to manage the spectrum held by PTC. For regional licenses, TTCI performs ULS searches and coordination office functions as necessary regarding co-channel and adjacent-channel users in adjacent markets.

IV. EQUIPMENT DEVELOPMENT

The four PTC radio models, developed by Meteorcomm LLC and produced by two manufacturers, have been in production since 2012. These radios are effectively meeting the industry's demands. The radio hardware designs are proving to be very stable, with no known problems. The software supports all basic PTC functionality, and new functions and features will be added through a program of scheduled software releases. For example, Meteorcomm recently implemented automatic gain control ("AGC") in its radio products to reduce locomotive radio blocking and therefore improve system reliability.

As previously reported, all radios have Part 90 certification and Meteorcomm has received Part 80 certification for these radios to accommodate users who might choose to operate on Automated Maritime Telecommunications System ("AMTS") spectrum below

220 MHz. Meteorcomm is supporting North East Corridor stakeholders in the effort to develop an interoperable PTC communication system for the region.

V. FIELD TESTING

As described below, 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. Most notably, a new milestone occurred during the current reporting period, as member railroads began establishing and testing back office messaging system links between their networks, a process known as “federation.” Federation is a crucial step in deploying PTC: in order for railroads to share the use of a base station and frequency in an area, the messaging systems of the railroads must be connected so that they are capable of routing messages between back offices and to specific base station radios.

CSX. In preparation for Revenue Service Demonstration (“RSD”) early next year, CSX has performed Field Qualification Testing (“FQT”) exercises, which required successful delivery of Wayside Status messages over various communications paths, including the 220 MHz network on the Wilmington subdivision. Additional FQT exercises are scheduled throughout the remainder of the year and into 2015. CSX has also completed the FRA-required Wayside Asset validation on several subdivisions in preparation for FQT and RSD exercises scheduled to be performed throughout 2015.

In addition, CSX, with active participation from Norfolk Southern, has completed Wayside Asset validation on the Aberdeen subdivision, in preparation for FQT exercises early next year, and performed network federation testing with Norfolk Southern. Network federation is and is a critical step in providing for PTC interoperability. CSX and Norfolk Southern

interoperate in the northern portion of the Aberdeen subdivision, requiring production network federation and coordination to successfully deliver Wayside Status messages. This process is scheduled to be completed at the end of this year.

Norfolk Southern. In close collaboration with the FRA, Norfolk Southern began its first formal FQT in August of this year. The testing was conducted in South Carolina on a corridor which extends approximately 110 miles between Charleston and Columbia, SC. Prior to beginning, NS performed numerous drive testing runs to confirm predicted RF coverage. The corridor was fully equipped with 220 MHz radio service, which included six base stations and 35 wayside locations. NS also equipped four locomotives with a full complement of equipment to make the locomotive PTC-ready, including the 220 MHz radios. The 220 MHz communications system provided consistent and reliable communications in support of all the test cases during the test period.

BNSF. BNSF launched ITCnet Planning Module (“IPM”) Slot Plan testing on its Wichita Falls Subdivision. PTC-enabled locomotives are identified each morning and are then inserted with special IPM log commands and set up to proceed on its normal operational course. Bases and waysides are also configured with additional IPM logging features. At the end of the day, logs from the locomotive, base and wayside stations are collected and moved to the IPM parsing process, to validate IPM functionality. BNSF plans to implement IPM slot plan testing on two additional subdivisions. Many challenges remain in IPM slot planning, including the functionality of the slot plan in a dense urban area involving multiple railroads.

BNSF also spearheads the drive testing and model tuning efforts for PTC-220. Model tuning, a key component of the RF engineering process, uses test drive data to adjust existing computer models so that the RF signal predictions will be as accurate as possible. In addition,

tuned models are embedded with a signature feature which enhances model accuracy selection for an area, hence eliminating the risk of an RF engineer using an incompatible model. A significant portion of this process has been completed. To date, 16 models have been drive tested and tuned for PTC use, out of a total of approximately 37 models for which tuning will be needed.

Union Pacific. UP has been fully engaged in FQT since April 2014. Multiple rounds of drive testing were carried out to complete the 220 MHz network coverage of the Santa Barbara subdivision from Camarillo to Ellwood, a total of 48 miles of track coverage. In this recent testing, UP observed 220 MHz interference issues and is now working with the other railroads in the vicinity to identify the root cause.

Additionally, UP has built a 220 MHz Communication Validation Tool that is used to verify adequate coverage and identify any coverage gaps. UP has also established federation links with BNSF and Metrolink. UP and Metrolink are working together to develop, by November 2014, the capability to forward a wayside status message from another railroad's 220 MHz base station radio. Finally, UP is preparing for Field Qualification Testing in the Los Angeles, Alhambra, Yuma and Mojave Subdivisions.

VI. SPECTRUM

Spectrum Needs Analysis. Based on TTCI's spectrum needs analysis work, the emerging picture is that PTC-220's spectrum should be sufficient to support its PTC operations in most areas, provided that PTC-220's pending waiver requests, described below, are granted. Significant uncertainty remains, however, with regard to spectrum needs along the Northeast Corridor. The most immediate concern is for additional spectrum in the New York/Newark area, where PTC-220 has received recent requests from commuter railroads for additional PTC

spectrum. As a result, PTC-220 is in discussions to acquire additional spectrum on the secondary market in New Jersey to help address this spectrum shortfall.

In addition, these requests from commuter railroads prompted PTC-220 to look more closely at the spectrum band plan in BEA 10 (New York-North New Jersey-Long Island, NY-NJ-CT-PA-MA-VT) to determine the holders of the frequencies adjacent to the channels on the license PTC-220 holds for this market. This license is one of several in PTC-220's inventory composed of non-contiguous 5 kHz channels (the "Non-contiguous Licenses"), which cannot be used to form the 25 kHz channels needed for PTC-220's technology, or the 12.5 kHz channels needed for the ACSES technology used by many commuter railroads. In conducting this band plan analysis, PTC-220 discovered that many of the channels interleaved with PTC-220's channels are held in the FCC's spectrum inventory as the result of licenses that were cancelled for failure to construct. PTC-220 has engaged in informal discussions with FCC staff regarding the potential feasibility of exchanging some of the Non-contiguous Licenses for other spectrum in EAG001 currently lying fallow in the FCC's inventory, which could be used (after completing some additional secondary market transactions) to create channels sufficient to accommodate PTC-220's technology. The type of spectrum exchange contemplated by PTC-220 could be accomplished through the FCC's license modification authority found in Section 316 of the Communications Act.¹⁰

Finally, the situation along the Northeast Corridor is complicated by a new concern that PTC communications in the 220 MHz frequency band might be disturbed by electromagnetic (EM) emissions generated from the high-powered catenary systems that supply electrical power

¹⁰ 47 U.S.C. § 316; see Improving Public Safety Communications in the 800 MHz Band, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd. 14969, ¶¶ 62-84 (2004).

to the locomotives of passenger railroads. PTC-220 has engaged Meteorcomm to evaluate the potential risk from these EM disturbances to PTC operations by performing onboard EM interference measurements along Northeast Corridor tracks.

Pending Waiver Request. As previously reported, on February 1, 2013, PTC-220 filed requests for waivers of certain FCC rules which, *inter alia*, limit power and antenna height of transmitters in the 221-222 MHz band.¹¹ As outlined in the filing, 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"). After lengthy technical discussions, PTC-220 and NRTC, as well as PHI Service Company ("PHI") (PHI's parent entity had filed *ex parte* comments), have entered into a coordination agreement, and NRTC and PHI have requested withdrawal of their FCC filings. Although the need for the waivers has delayed the construction of base stations in certain areas, PTC-220 is hopeful that the recent resolution of NRTC's and PHI's concerns will pave the way for a grant of the requested waivers in the near future.

J Block Swap. In July, PTC-220 and the Association of American Railroads ("AAR") filed applications with the FCC seeking authority to exchange PTC-220's 220 MHz J Block licenses for AAR's nationwide 220 MHz license which is currently used in rail yards for the remote control of locomotives ("RCL"). The proposed exchange will increase the amount of usable spectrum available for both PTC and RCL operations, while simultaneously reducing the

¹¹ 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).

risk of interference between the two services. After the swap, railroads will be able to use the J Block Licenses for specialized PTC applications (such as for “fill in” sites between existing base stations where signal coverage is weak), in areas where such operations will not interfere with RCL operations.

Non-Member Spectrum Leases. Finally, PTC-220 has entered into spectrum manager leases with non-member railroads including CalTrain, MetroLink, North Country Transit District, and Sound Transit. In addition, testing leases were signed with the Alaska Railroad, Amtrak and the Massachusetts Bay Transportation Authority, and negotiations to finalize a full lease with these parties continue. PTC-220 is in active leasing negotiations with 14 other non-member railroads. The leases are an important threshold step enabling future construction by these railroads on PTC-220’s licenses.

VII. INTERNATIONAL CROSS-BORDER SPECTRUM ARRANGEMENTS

PTC-220’s member railroads have worked closely with the leadership and staff of the FCC’s International Bureau and the Wireless Telecommunications Bureau to coordinate the operation of PTC along the nation’s international borders. The current interim sharing arrangements governing use of the 220-222 MHz frequency band between the US and Canada and the US and Mexico are fourteen and nineteen years old, respectively and, as currently written, do not appear to permit PTC operations near US international boundaries. The 1999 interim sharing arrangement with Canada, for example, imposes certain restrictions on 220-222 MHz operations within 120 kilometers of the US-Canada border, including 5 kilohertz channelizations with designated, service-specific US and Canadian uses; a maximum power flux density (“pfd”) at any point at or beyond the border not to exceed -108 dBW/m²; a maximum

EIRP limit in the 220-221 MHz band that ranges from 5 watts to 500 watts, depending on antenna height; and a maximum EIRP limit in the 221-222 MHz of 50 watts with a maximum height above average terrain of seven meters. The 1994 arrangement with Mexico imposes similarly impractical restrictions.

Due to very low levels of incumbency in the 220-222 MHz spectrum in both Canada and Mexico and anticipated changes in the use of the band similar to those the United States is experiencing, the current restrictions along the US international boundaries no longer appear to be necessary to protect existing or planned spectrum users in Canada and Mexico. Against this backdrop of limited incumbency and changing usage in the 220-222 MHz bands of the neighboring countries, the FCC's International Bureau raised the issue of reforming the existing Interim Arrangement with the Canadian regulator, Industry Canada, during a January 2013 meeting in Ottawa, Ontario. With the support of PTC-220 member railroads, the FCC's International Bureau successfully placed the need for new cross-border coordination on the agenda of the Radio Technical Liaison Committee ("RTLIC"), which provides a forum for direct exchange of information between the technical experts of both Canada and the US with the aim of promoting early coordination on spectrum allocations and achieving spectrum sharing arrangements necessary for the licensing of individual stations. Subsequent work sessions and correspondence between the FCC and Industry Canada led to an exchange of draft revisions that appear to promise reform of the existing arrangement to accommodate technical changes and the new uses contemplated through the planned PTC deployment. The FCC submitted a draft Interim Letter Agreement to Industry Canada in February 2014.

Talks have progressed between the FCC and Industry Canada over the past few months to finalize the agreement. The FCC and Industry Canada held a meeting of the US-Canada Radio

Technical Liaison Committee (RTLTC) in Washington, DC, where discussions continued. While the FCC reports progress in the negotiations, the two agencies reportedly continue to discuss the precise allocation of frequencies in the border region.

Upon approval of the document at the staff level, lawyers working for the US Department of State will review the document and collaborate with their counterparts at Industry Canada. The FCC has said that this process should not require more than a few weeks and the FCC has committed to request expedited legal review of the agreement from the Department of State; nevertheless, delays during legal review are possible.

Barring problems in finalizing the RTLTC-level agreement or unanticipated issues during legal review, the document will be signed by the FCC International Bureau Chief, the NTIA Administrator, and a representative of Industry Canada. The new arrangement between the US and Canada will become effective upon signature.

The status of cross-border negotiations with Mexico is less clear. On June 10, 2013, the Mexican President, Enrique Peña Nieto, signed into law an amendment to the constitution that includes an overhaul of the telecommunication and broadcast industries and creates a new telecommunication regulatory body: the Federal Institute of Telecommunications (“IFETEL”). IFETEL replaces Mexico’s Federal Telecommunications Commission (“COFETEL”) and will have expanded licensing and anti-trust powers. Under the constitutional amendment, the Mexican Congress was given until December 2013 to enact and approve enabling legislation to transition from COFETEL to IFETEL. While COFETEL is thus still nominally the Mexican telecommunications regulatory body, COFETEL has, for all practical purposes, stopped functioning and, thus, the FCC International Bureau had no Mexican counterpart with which to negotiate for an extended period of time. Now that IFETEL has commenced operations in

earnest, revisions to the current US-Mexico protocol governing the 220 MHz spectrum along the southern border should be possible. The FCC reports that it has begun an informal correspondence with Mexico on revisions to the 220 MHz cross-border agreement; however, those negotiations are likely to require considerable time to become a formal revision to the current arrangement between the two countries. Thus, while PTC-220 member railroads will pursue all available means to support modifications to the cross-border arrangements between the United States and Mexico, PTC-220 member railroads may need to pursue alternative arrangements, such as applications for special temporary authority, to allow operations near the Mexican border.

VIII. NETWORK PLANNING TOOLS

As described previously, field testing of the ITCnet Planning Module (IPM) time slot plans exposed issues that required modification to the planning method. The most recent release on the IPM module was in June 2014. The June 2014 release was primarily focused on improving IPM performance. Meteorcomm LLC is working with InfoVista to continue improving the number of sites processed within a single slot plan. The goal is to be able to process large MTAs in a single slot planning cycle. The IPM tool is installed on a hosted server to allow wider testing. Railroads are sharing project data on the server for base station frequency planning and usage authorizations.

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 InfoVista (which acquired Mentum in 2012) under contract to PTC-220. Lessees of PTC-220 spectrum are provided access to the tools pursuant to a provision in the lease. The hosted environment makes

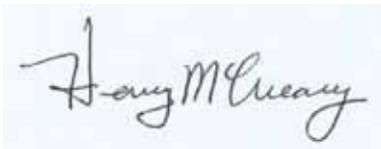
possible the coordination of independent but geographically adjacent network design projects so that each design takes into account all adjacent projects. For this reason, it is important that all projects be implemented in a consistent way. PTC-220 has developed standards for the building of projects, and is working with InfoVista to provide classroom training as well as WebEx sessions on specific topics. To date, 64 engineers have completed the training to be certified to use the PTC-220 hosted environment.

PTC-220 also contracted with InfoVista to develop a Cross Border Tool (“CBT”). The underlying height and clutter files used by the Mentum Planet RF prediction tool are divided into 51 Major Trading Areas (“MTAs”) covering the United States. Because railroad subdivisions and districts cross MTA borders all across the country, the CBT will help RF engineers by automatically syncing the data in the border area along two MTAs. PTC-220 is in the process of implementing this tool across all of the projects on the Hosted Server.

Finally, PTC-220 member railroads have worked with RadioSoft to develop and test an online tool to predict out-of-band emissions. Once transmitter and receiver data is entered, the software will examine terrain path(s) between the transmitter and receive antennas, apply a path loss and adjacent channel formula, then determine how much energy is present at the receive antenna.

IX. CONCLUSION

Important progress has been made in the past weeks and months on several issues that have been the cause of delay in building out a nationwide PTC network. First, the recent resolution of issues surrounding the Section 106 review process should lead to a significant expansion in the deployment of PTC wayside infrastructure in the coming months. Likewise, PTC-220 is hopeful that the recent coordination agreement reached between PTC-220, NRTC and PHI will lead to a grant of PTC-220's 2013 Waiver Request, which will allow member railroads to move forward in constructing base stations in areas where greater power or antenna heights are needed. Finally, the imminent revision of the US-Canada agreement governing the 220 MHz band will allow for PTC build-out in the border region to move forward in the near future. Although these and other issues have negatively impacted PTC-220's planned construction schedule, PTC-220 members are moving forward with construction as expeditiously as possible.



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