

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Progeny LMS, LLC)	
)	WT Docket No. 11-49
Petition for Waiver of the Rules)	
And Request for Expedited Treatment)	

COMMENTS OF ITRON, INC.

Itron, Inc. (“Itron”), by its attorneys, submits these comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) Public Notice seeking comment on test results filed on October 31, 2012.¹ Itron fully supports the comments filed by the Part 15 Coalition (the “Coalition”).² As demonstrated herein, in the Coalition’s comments, and in other filings in this proceeding, the Progeny system should not be allowed to commence operation because of the severe adverse impacts it will have on many unlicensed users of the 902-928 MHz band.

Itron, the nation’s leading manufacturer and supplier of Advanced Metering Infrastructure (“AMI”) and Automatic Meter Reading (“AMR”) technologies, supplies and/or operates hundreds of Critical Infrastructure systems using unlicensed devices in the 902-928 MHz band, systems which are used by water, gas and electric utilities.

Itron 902-928 MHz devices vary greatly in design. These systems range from pole-mounted fixed devices that have more than a two-mile radius, to handheld and

¹ Public Notice, *The Wireless Telecommunications Bureau and The Office of Engineering and Technology Seek Comment on Progeny’s Joint M-LMS Field Testing Reports*, WT Docket No. 11-49 (rel. Nov. 20, 2012).

² *In the Matter of Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules*, Comments of the Part 15 Coalition, WT Docket No. 11-49 (filed Dec. 21, 2012).

drive-by mobile devices, to low cost consumer engagement devices listening to several endpoints within a home. Itron systems also vary in terms of what optimal RF deployment solutions are used, some as simply transmitting at certain intervals to obtain messages, with these intervals dependent on the power level and battery life (if applicable) of the device. Legacy Itron devices can perform frequency hopping, but only over a limited number of channels, and thus their operations are disproportionately centered in the middle of the 902-928 MHz band, near the center M-LMS block (on which Progeny operates). More than 100 million Itron meter modules, which include the legacy devices, have been shipped nationwide for use on this band.

BACKGROUND

This proceeding arises out of a waiver granted to Progeny last year that will allow it to deploy a Multilateration Location and Monitoring Service (“M-LMS”) system if it can demonstrate through actual field testing with unlicensed devices that its system “will not cause unacceptable levels of interference to Part 15 devices that operate in the 902-928 MHz band.”³ In an attempt at compliance, Progeny undertook one-sided testing of a few unlicensed devices.⁴ Itron and other parties, however, have demonstrated that this unilateral Progeny testing was wholly inadequate to inform the Commission’s decision in this matter.⁵

³ *In the Matter of Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules*, Order, 26 FCC Rcd 16878, 16887 (2011) (“*Progeny Waiver*”); see also 47 C.F.R. § 90.353(d). The Progeny waiver allowed it to satisfy the M-LMS build out requirement with a system that transmits using just one transmission path (forward links/beacon signals), and to provide location monitoring services to non-vehicular mobile devices on an equal basis as vehicular devices.

⁴ Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC to Marlene H. Dortch, Secretary, Federal Communications Commission, Progeny LMS, LLC Demonstration of Compliance with Section 90.353(d) of the Commission’s Rules, WT Docket No. 11-49 (filed Jan. 27, 2012) (“*2011 Test Results*”).

⁵ See e.g., RKF Engineering Analysis of Progeny Part 15 Test Report, WT Docket No. 11-49 (filed March 15, 2012 as an attachment to Itron Comments) (“*RKF Analysis*”).

Subsequently in response to a request by FCC staff, Itron, Landis-Gyr, and the Wireless Internet association (“WISPA”) engaged in field testing with Progeny in San Jose, California for the purpose of determining the effect of the Progeny LMS system on unlicensed use. The parties filed test reports setting forth the results of the first round of testing,⁶ and Itron filed its own test report of a second round of testing, which was done with Progeny’s knowledge but not with its active cooperation.⁷ The overall conclusion from all of the testing is that transmissions from the Progeny beacons will result in significant throughput loss to many unlicensed devices operating co-frequency with Progeny, effectively precluding unlicensed users from Progeny’s proposed 4 MHz of the available 902-928 MHz band, and in other portions of the band in which other M-LMS licensees may seek operations that are similar to those of Progeny. Congestion will increase in the remaining portion of the band as unlicensed users seek to avoid interference from Progeny and any other such M-LMS licensees.

DISCUSSION

The purpose of the M-LMS testing requirement is to ensure “that LMS systems are not operated in such a manner as to degrade, obstruct or interrupt Part 15 devices to such an extent that Part 15 operations will be negatively affected.”⁸ Indeed, when the Commission created the M-LMS service, its focus was on “minimizing potential

⁶ Joint Itron-Progeny Testing is attached to the Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC and Laura Stefani, Counsel for Itron, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, Progeny LMS, LLC & Itron, Inc., Request for Confidential Treatment, Part 15 Joint Test Report, WT Docket No. 11-49 (filed October 31, 2012) (“*Progeny-Itron Test Results*”).

⁷Itron Second Round Test Results, WT Docket No. 11-49 (filed Dec. 17, 2012). Itron technical staff returned to San Jose between October 16 and 19, 2012 to conduct PER testing at fourteen additional test sites. These test sites were requested by Itron during prior discussions with Progeny, but the parties ran out of time to conduct during the first round of testing.

⁸ *In the Matter of Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Report and Order, 10 FCC Rcd 4695, 4737 (1995) (“*1st M-LMS Order*”); see also *In the Matter of Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Order on Reconsideration, 11 FCC Rcd 16907, 16911-12 (1996) (“*M-LMS Reconsideration Order*”).

interference within and among the various users of the 902-928 MHz band,”⁹ which essentially held incumbent status. Based on the testing, as well as Progeny’s misleading statements regarding the impact of its system on unlicensed use of the band, it should be abundantly clear that the Progeny system fails this threshold requirement of the FCC rules.

A. The Progeny System

The presently planned Progeny system is unlike anything the FCC envisioned when it crafted the M-LMS rules in 1995. At that time, M-LMS systems were intended for Intelligent Transport Systems, essentially to locate vehicles throughout a wide geographic area using spread spectrum technologies, “by measuring the difference of time of arrival, or difference in phase, of signals transmitted from a unit to a number of fixed points.”¹⁰ The Progeny system sends messages to a mobile device from at least three fixed high duty cycle beacons, so the device can compute its location based on the reception of the beacon signals.¹¹ This uses the highest power transmission path available to M-LMS licenses, *i.e.* 30 W ERP signals from the beacons. As well, Progeny’s proposed use of the spectrum is location services for mobile advertising and E911 purposes, which ultimately will require increasing the duty cycle of each beacon and subsequently the composite duty cycle for all beacons. Ultimately, if advertisement penetration is Progeny’s end goal, increased beacon density and simulcast of the beacons on all of Progeny’s licensed frequencies would be inevitable. Clearly, the system is not designed, as Progeny claimed in its waiver request, to reduce the amount of interference potential to unlicensed users.

⁹ *In the Matter of Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 12 FCC Rcd 13942, 13945 (1997) (“*M-LMS MOO*”).

¹⁰ *M-LMS MOO* at 13944. Itron believes that the Commission’s intent was for these systems to use low duty cycle pulse signals.

¹¹ *Progeny Waiver* at ¶ 16.

In particular, Progeny has claimed that its system employs up to 20% duty cycle.¹² This is not the case. Wherever Progeny operates multiple beacons, with one or more beacons per tower location, it is likely that unlicensed devices will “see” and receive interference from more than one beacon, which effectively multiplies the Progeny duty cycle to which the unlicensed device is exposed.¹³ For example, in the San Jose testing, an effective 80% duty cycle was observed as unlicensed devices “saw” a Progeny beacon in eight out of ten time slots. Also, during the second round of testing, at times Itron observed a 90-100% duty cycle.¹⁴

Indeed, as the Progeny system has evolved while it is being deployed, it has developed in a direction that poses more of an interference threat to unlicensed users. The Progeny system observed by Itron in the San Jose testing in July 2012 differed in several ways from the system on which Progeny performed its own testing in December 2011.¹⁵ The Progeny system now is operating at greater signal strength, and according to Progeny staff additional beacons have been added in the San Jose area since last December. Additionally, the Progeny system in July was still very much in an initial test stage, as staff was dealing with bugs and software changes and Progeny did not yet have its indoor beacons deployed. As mentioned, Itron observed a higher duty cycle during October testing.

B. Test Conclusions

The overall conclusion of the testing is that the Progeny system will preclude unlicensed operation on at least two 2 MHz channels, or 4 MHz total.¹⁶ Indeed, Itron’s

¹² 2011 Test Results at p. 1 of Attachment 1.

¹³ The Progeny system is synchronized and the beacons are time cycled. The duty cycle observed during initial Progeny-Itron testing was 100 ms, sequential, 8 slots on and 2 slots off, which Progeny staff explained was their standard design, with the 2 slots off reserved for indoor use.

¹⁴ Progeny is not restricted from using all ten of its time slots.

¹⁵ See 2011 Test Results.

¹⁶ See Letter from Stephen E. Coran, Counsel for WISPA to Marlene H. Dortch, Secretary, Federal Communications Commission, Ex Parte Notice, WT Docket No. 11-49 (filed Nov. 8, 2012) (“Part 15 Parties Ex Parte”).

second round test results show that Progeny's proposed system is not only harmful to unlicensed systems within the primary area of targeted operation, but also well beyond their geographical coverage area.¹⁷

Specifically, test results show that the Progeny system, when fully deployed in its normal operating manner, and especially in high density, urban areas where a high number of beacons are required to penetrate buildings sufficiently, will degrade significantly the performance of many unlicensed radio devices on those channels on which Progeny operates. Itron, too, is at risk from this preclusive effect, since wherever Progeny has collocated high powered beacons, collocated endpoints will need mitigation.

Moreover, even in the portions of the band in which Progeny will not operate, the performance of unlicensed radio systems will be degraded due to the compression effect of many other unlicensed users moving into the non-Progeny portion of the band. The adverse preclusive and compression effects resulting from Progeny's operations will be magnified further once the other M-LMS licensees secure waivers comparable to the relief accorded Progeny.

C. Progeny's Position is Not Supportable

Progeny has not met its burden of showing that it does not cause unacceptable interference to unlicensed devices. Testing shows that the effect of Progeny's system is not, as Progeny claims, a minor degradation in the performance of unlicensed devices in the band. That claim can only be made based on a misleading analysis that considers the impact of the Progeny system across the entire 26 MHz of spectrum of the 902-928 MHz band, while Progeny operates on only 4 MHz. Such an analysis minimizes the interference impact of the Progeny system and is not the analysis required by the Commission's rules. If it were, Progeny would be permitted to remove at least 4 MHz of the band from unlicensed use because, in general, unlicensed devices

¹⁷ Itron Second Round Test Report at pgs. 3 and 7.

could use the balance of the band in which Progeny does not operate. Rather, Progeny must show that its transmissions do not cause unacceptable interference to unlicensed devices that operate co-frequency with it. The test results prove that Progeny cannot make this threshold of cooperative band sharing.

Indeed, the fact that Progeny's focus has been to argue that unlicensed users can somehow work around its system, by, for example, frequency hopping and using the remaining channels on the band,¹⁸ tells the FCC that even Progeny recognizes that unlicensed users cannot function co-frequency with its system. Were there no demonstrable loss in throughput in the field testing, there would be no need for Progeny to manipulate the data to focus on the effects of the system across the entire band rather than on just its frequencies.

Instead, Progeny tries to convince the Commission to ignore the unacceptable interference within the co-shared 4 MHz and focus on the portions of the band other than those on which Progeny has precluded unlicensed use. For example, without pausing to express concern about the millions of unlicensed devices that already occupy the "Progeny frequencies" and would be trapped there once Progeny begins operation, Progeny suggests that Itron and other unlicensed users could re-engineer their systems to move to other channels to avoid Progeny signals. This could be a time-consuming, costly and burdensome exercise requiring design changes of current systems in the field, and in some cases reconfiguring field devices via individual visits to each device, as well as adding additional equipment to fill-in holes.

And contrary to Progeny's position,¹⁹ frequency hopping capabilities do not ameliorate the effects of the Progeny system, because if 15% of the channels are unusable, additional energy will be expended hopping through those unusable

¹⁸ See Letter from Bruce A. Olcott, Counsel to Progeny LMS, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, Demonstration of Compliance with Section 90.353(d) of the Commission's Rules, WT Docket No. 11-49 (filed Oct. 31, 2012) ("*Progeny October Letter*").

¹⁹ *Progeny October Letter* at 3-4.

