FILE

BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Protocols for the)	
Measurement and Verification of Energy)	Case No. 09-512-GE-UNC
Efficiency and Peak-Demand Reduction)	
Measures.)	

REPLY COMMENTS ON DRAFT TECHNICAL REFERENCE MANUAL BY

THE OFFICE OF THE OHIO CONSUMERS' COUNSEL,
CITIZENS' COALITION, CITIZEN POWER, SIERRA CLUB OF OHIO, THE
NATURAL RESOURCES DEFENSE COUNCIL, AND THE OHIO
ENVIRONMENTAL COUNCIL

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I. INTRODUCTION AND STATEMENT OF THE CASE

This section supplements the introduction in the Comments filed on November 3, 2010, by the Office of the Ohio Consumers' Counsel, Citizens' Coalition, Ohio Poverty Law Center, Citizen Power, Sierra Club of Ohio, the Natural Resources Defense Council, and the Ohio Environmental Council (members of the Ohio Consumer and Environmental Advocates, or "OCEA"). Objections and comments were filed on that same date by electric utilities in Ohio, ¹ gas utilities in Ohio, the Ohio Manufacturers' Association jointly with the Ohio Hospital Association, and OPower, Inc. These objections and comments focused on legal arguments against the manner chosen by the Public Utilities Commission of Ohio ("Commission" or "PUCO") to develop a technical reference manual ("TRM") for Ohio as well as technical comments designed to improve the TRM.

¹ Comments by Ohio's electric distribution utilities ("EDUs") are referred to as the "EDU Comments." Comments filed by Industrial Energy Users – Ohio simply state support for the EDU Comments, and are not separately mentioned.

These Reply Comments address the legal objections and the technical comments filed by interested parties. OPower, Inc.'s comments make essentially the same observations regarding the advisability of protocols ("Protocols") regarding behavioral programs that are made in Section II.A of the Comments by the OCEA members.²

Therefore, these Reply Comments do not further address OPower, Inc.'s comments (which the OCEA members support).

II. ARGUMENT

A. Use of the TRM is Lawful, and Legal Challenges Should be Rejected.

The EDUs repeat their previously discredited legal arguments, which should be rejected again. First, the EDUs mischaracterize R.C. 4928.66. The EDUs argue that the statutory language states that "any' and 'all' the energy efficiency programs and customer-sited capabilities of mercantile customers are eligible to be counted for compliance purposes." However, the EDUs fail to recognize the importance of the qualifying language in R.C. 4928.66(A)(2)(c) that permits the "effects of all demand-response programs for mercantile customers." to be counted. The word "programs" provides a qualifier regarding what may be counted towards energy efficiency and peak demand reduction requirements that the Commission cannot ignore. The EDUs argue that any effort by a mercantile customer should count, which is inconsistent with the plain language in the statute. The provisions of the TRM to which the EDUs object are

² Comments submitted by the OCEA members attached an OPower, Inc. document in support of the approach taken by OPower, Inc. OCEA Comments, Attachment (November 3, 2010).

³ EDU Comments at 10.

⁴ R.C. 4928.66(A)(2)(c) (emphasis added).

designed to ensure that measures only result from demand-response programs, and the TRM provisions are therefore consistent with the statute.

The EDUs also insist that actions taken that merely comply "with a building code or a federal or state requirement" should count towards their compliance requirements under R.C. 4928.66. Nothing in R.C. 4928.66 states that the Commission must allow utilities to count all energy savings achieved through any programs listed under R.C. 4928.66(A)(2)(c). The presence of the baseline calculation under R.C. 4928.66(A)(2)(a), which does not permit a utility to count most of the energy savings achieved before 2009, shows that the General Assembly did not intend utilities to count energy savings the utility or supplier may have achieved through requirements or commitments. The legislature did not pass the energy efficiency portions of S.B. 221 in order to initiate an elaborate accounting exercise whereby utilities measure the effects of equipment changes that would have happened even without enactment of the legislation. Instead, the General Assembly created an energy efficiency resource standard in order to increase energy efficiency beyond what would have occurred absent legislative action.

Second, a separate section of the EDU Comments continue the argument regarding the "baseline for calculating savings based on the highest standards of federal and state regulations, or market practices." The Commission should ensure that energy savings are achieved by utilities and electric suppliers above and beyond those amounts

⁵ EDU Comments at 9.

⁶ EDU Comments at 10, restating the result of the Commission's earlier pronouncement regarding baselines. Order at 9 (October 15, 2009). The comparison of new equipment installed against a baseline, determined as the higher of existing state or federal code or current market practices, is commonly referred to as the "baseline" method. "Under the 'as-found' method, savings are calculated by subtracting the energy efficiency of existing equipment from the proposed new, more efficient equipment." Id. at 8. The Commission's finding regarding such benchmarks in its October 15, 2009 Order was the subject of the OCC's efforts to clarify the Commission's directive regarding baselines. OCC Application for Rehearing at 2-3 (November 16, 2009).

otherwise required by law, regulation, or practices that are external to the provisions in R.C. 4928.66 except for the specific and narrow exceptions where customers commit specific savings that are above codes, minimum standards, and laws independent of R.C. 4928.66 requirements. The EDUs' comment upon the baselines determined by the Commission has been rejected before, and should be rejected once again.

Third, the EDUs devote a section of their Comments to arguments based upon the U.S. Constitution.⁷ It is well settled that the Commission does not hear constitutional arguments.⁸ These legal attacks on the Commission's approach to the TRM should be rejected.

B. Some, But Not All, of the EDUs' General and T&D Comments Should be Adopted.

These Reply Comments address the comments submitted by the electric utilities to the transmission and distribution ("T&D") portion of the draft TRM. This focus reflects the intended comprehensive nature of the draft TRM that extends its scope to T&D Protocols that are not contained in the TRM manuals developed in many other states.

1. Responses to the Electric Utilities' General Objections

The EDU Comments contain "General Objections To The TRM" on pages 19-24, delineated as objections "A" through "K." The following responds to these objections as replies "a" through "k."

⁷ EDU Comments at 13-19 (November 3, 2010).

⁸ See, e.g., In re Columbia Gas Infrastructure Replacement Program and Accounting Treatment, Case Nos. 07-478-GA-UNC, et al., at 23 (April 9, 2008) ("traditional constitutional law questions are beyond our authority to determine").

a. The Scope of the TRM Should Not Be Limited to Compliance Counting Only.

The EDUs' objection is vague, and fails to specifically identify the portions of the TRM that the EDUs believe "should be removed from the TRM and discussed, if at all, in another forum." The TRM's purpose is broader compliance with the requirements of R.C. 4928.66, as stated in the introduction to the draft TRM:

[A]s envisioned by the PUCO the TRM will serve a wide range of important users and functions, including:

- Utilities for cost-effectiveness screening and program planning, tracking, and reporting
- Mercantile customers for assessing energy savings opportunities
- The PUCO, the Independent Program Evaluator, and other parties

 for evaluating utilities performance relative to statutory goals,
 and facilitating planning and portfolio review
- Markets, such as PJM's Reliability Pricing Model (its wholesale capacity market) and carbon markets—for valuing efficiency resources¹⁰

A comprehensive TRM is valuable, and its application should not be limited as proposed by the EDUs.

b. The TRM is Not Inconsistent with the Mercantile Pilot Program, Especially with Regard to the TRM's Rejection of the "As Found" Method for Calculating Savings.

An important strength of the TRM is its rejection of the dubious "as found" method that is proposed by the EDUs. 11 The EDUs' approach is unrecognized, to the knowledge of the undersigned parties, in any jurisdiction that has considered a TRM.

The EDUs do not argue otherwise. The TRM provides for a scientific grounding for the

⁹ EDU Comments at 20.

¹⁰ TRM at 7.

¹¹ EDU Comments at 20.

energy savings by utilizing the energy efficiency industry standard "baseline" method along with rigorous definitions and specific algorithms for different measures.

c. The Effective Date of the TRM Should Not Prevent Timely Use of New Protocols.

The Commission should reject the EDU's proposal that "the TRM should become effective no sooner than the first year following the submission and approval of the EDUs next portfolio plan." Given the existing three-year cycle of portfolio filings, the EDUs' proposal would limit use of the TRM for at least the next three years. Instead, the TRM should be used to determine savings on a going forward basis after the TRM is finalized and approved by the Commission.

Immediate use of the TRM does not conflict with the view that the TRM is a living document. The TRM Maintenance and Update Process contained in Appendix D of the TRM should be approved by the Commission.

d. The Deemed Savings are Not Minimum Values.

The "deemed" energy saving values should not be considered minimum values.¹³ These "deemed" values have an equal chance of overestimating or underestimating the level of energy savings so the minimum value moniker is not warranted. As future "deemed" energy savings values will be better informed by the independent third party monitoring and verification process and modified as appropriate for their prospective application in future planning, reporting and compliance undertakings, no minimum designation is necessary.

¹² Id. at 21.

¹³ Id.

e. Additional Definitions Should be Included in the TRM.

The EDUs' request for additional definitions is appropriate. Such definitions will render the TRM more readable and may help to clarify matters as well as avoid future disputes.¹⁴

f. The TRM Appropriately Includes a Degradation Factor.

A degradation factor should be included in the calculation of energy savings that are contained in the TRM.¹⁵ This is a common industry practice that acknowledges that the performance of an energy efficiency measure may degrade over time.¹⁶ It is also incorrect to assume a net degradation impact of zero when comparing two completely different technologies providing the same end use service. The degradation factor is also informative when determining lost revenues for cost-recovery purposes in a distribution lost revenue mechanism.

g. The TRM's Discount Rate Should Not be Adjusted as Proposed by the EDUs.

The Commission should reject the EDU's assertion that the discount rate proposed by VEIC is "arbitrary." The discount rate used in the TRC should reflect the

¹⁴ Id. at 22.

¹⁵ Id. at 24.

¹⁶ For example, the Efficiency Maine Technical Reference User Manual No. 2006-1 ("Maine TRM") contains persistence factors "in recognition that initial engineering estimates of annual savings may not persist long term." Maine TRM at 4, available at: http://www.ceel.org/eval/db_pdf/566.pdf. The Pennsylvania TRM also accounts for measure retention and persistence of savings. Pennsylvania Public Utility Commission, Technical Reference Manual for Pennsylvania Act 129 Energy Efficiency and Conservation Program and Act 213 Alternative Energy Portfolio Standards at 5 (May 2009), available at: http://www.puc.state.pa.us/electric/Act129/TRM.aspx.

¹⁷ EDU Comments at 24. The determination of a discount rate for determining net present value calculations were discussed at length in the comments submitted to the Commission regarding Appendix C to the entry dated October 15, 2009. Appendix C endeavored "to define as clearly as possible an expedient approach for all of the Ohio electric utilities to compute energy efficiency cost-effectiveness using a standard approach." Entry, Appendix C at 1 (October 15, 2009).

risk of an investment in energy efficiency and other decisions that customers and businesses make to exchange money now for a later payoff. The historic returns of the markets where customers make these explicit choices -- bonds, equities, and houses -- are in the range of 2-5 percent (net of inflation). After receiving extensive comments, the federal government chose to use a 3 percent real discount rate for evaluating the future costs and benefits of energy efficiency investments.¹⁸

It is inappropriate to use a utility's WACC in the TRC since the WACC is an average of a variety of investments of different risk. However, in the Utility Cost Test, it is appropriate to use the WACC because the purpose of the Utility Cost Test is to compare energy efficiency to other utility system investments. The lowest rate reflecting the benefit to society over the longer-term is appropriate if the Societal Test is used. For the Participant Cost Test, the residential discount rate should be the annual percentage rate of the highest risk adjusted rate of return a residential customer can obtain by investing or the lowest rate at which residential customers can borrow, whichever is higher. Since the latter rule of thumb may be difficult to approximate at any given point, a home equity rate will make a good proxy and should be adopted by the Commission.

h. The Annual Cycle for Updating the TRM Should be Adopted.

The annual cycle of updating the TRM should be retained and the three-year cycle recommended by Ohio's EDUs should be rejected. Once the initial TRM is finalized and approved by the Commission the annual update process contained in Appendix D of the TRM should be adhered to. The annual TRM update process makes sense since

¹⁸ U.S. Department of Commerce, Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis, Publication # NISTIR 85-3273-19 at 1 (April 2004).

¹⁹ EDU Comments at 25.

program impact evaluations can start after a full year of program operation. This ensures that the latest and best information is incorporated into the utility energy efficiency planning process. This also allows new measures to be added annually.

Online Access Should be Provided to the Reports
 Referenced by the TRM and to Other Informational Sources.

Online access for referenced reports cited in the TRM is desirable.²⁰

j. The Proposed Zip Code Mapping is Desirable.

The inclusion of a zip code mapping table to the appropriate reference city to apply EFLH values would be helpful in facilitating the energy savings calculation.²¹

k. The Collection of Commercial and Industrial Baseline Data for Removed Equipment Should be Mandatory.

The collection of commercial and industrial baseline data for removed equipment should be required rather than optional as recommended in the EDU Comments.²² This information is critical when determining the savings of a measure replaced before the end of its useful life where an excess over "baseline" savings may be credited for a number of years before reverting to a "baseline" savings calculation.

The EDUs' proposal that the building types in the TRM be expanded should be adopted.²³

²⁰ Id. at 26.

²¹ Id.

²² Id. at 26-27.

²³ Id. at 27.

2. Responses to the Electric Utilities' Transmission and Distribution Comments

The EDU Comments contain comments concerning "Transmission and Distribution" on pages 67-73, delineated as objections and comments 1 through 16. ²⁴

a. The Industrial Baseline Data for Removed Equipment Should be Mandatory.

For transmission and distribution projects offered for energy efficiency and peak demand reduction compliance, utilities should make use of specific load duration information for calculating the energy loss data. ²⁵ This data is or should be available at or near the location of any proposed project. Metering at the consumer or feeder or substation level can provide the site specific values. Using system wide generic loss factors can result in over estimating the losses. This is especially true for electric transmission and distribution systems with large industrial customers exhibiting high load factors. High load factors yield higher loss factors, which in turn forecast higher losses. A residential feeder will most likely have a low load factor and an industrial circuit will tend to have a high load factor. The loss factor is equal to the square of the load factor. So errors in the load factor yield much longer errors in the losses. For example an error in the load factor of just 5 percent results in an error of nearly 10 percent in the system losses.

Therefore, when the electric utilities argue for provisions that are supported by "typical engineering practice," one expects that this requires a detail review of the "typical engineering practice" and that the purpose of the protocol is to establish this

²⁴ Id. at 67-73.

²⁵ OCEA Comments at 11-12 (November 3, 2010).

²⁶ EDU Comments at 67.

practice. The International Performance Measurement and Verification Protocol

("IPMVP") states its purpose is to "to develop a consensus approach to measuring and
verifying efficiency investments." The use of site specific load duration curves
provides a better means for savings verification than a loss factor based on system wide
data. The intent of the verification process is to allow two parties to contractually agree
on the savings achieved. Loss factors may be used internally to determine estimated
savings when comparing alternate solutions to an engineering problem, but the specific
load curves provides a measured means which promotes confidence.

b. The TRM Should Not be Undermined by EDU Claims that Projects are "Unique." 28

The EDUs propose to undermine the TRM under the guise of complexity and the lack of data. The EDU and its T&D system is no more complex than an industrial complex or the energy savings within a building. Standard protocols are designed to provide transparency to the electric consumers as to the savings of energy.

Transmission monitoring of load at or near nodes of the systems allows for the load data necessary to create and utilize a load duration curve. Modern electric systems should have capabilities to capture hourly demands on their transmission infrastructure. The normalization of the load duration curve can then be used for losses.

²⁷ IPMVP at 5, available at: http://www.nrel.gov/docs/fy02osti/31505.pdf.

²⁸ EDU Comments at 67.

c. Estimates and Average Values Should Not be Used When More Detailed Data is Available.

The EDUs argument for the use of traditional estimating methods" should be rejected.²⁹ The load duration approach is the superior method to traditional estimating methods because it measures performance and does not estimate performance. The load duration curve is a measurement of actual system performance at or near the site of the energy efficient project, but a loss factor is merely an estimate of savings. An average system-wide method should not be used when more detailed load duration data is available with modern power systems.

d. The Standardization Resulting from an Ohio TRM Should Not be Undermined by Inconsistent Engineering Practices by the EDUs.

The "typical engineering practice" proposed in the EDU Comments is inconsistent among utilities. The paper referenced by Ohio Edison in a related filing with the Commission discussed several different methods for determining loss factors. According to Ohio Edison's responses to discovery in that case, its transmission department used one calculation and its distribution department used a different method for such calculations. The purpose of the Protocol is to establish a single method for Ohio, which is not served by the EDU's proposal.

Finally, the EDUs' statement that data is not available³² is difficult to comprehend in an era when utilities rely upon modern SCADA systems. Projects that are not

²⁹ Id. at 67.

³⁰ Id. at 68.

³¹ In re FirstEnergy T&D Programs, Case No. 09-951-EL-EEC, Application, Exhibit B (October 14, 2009).

³² EDU Comments at 68 ("8766 is not available").

supported with data should not be used to meet the energy efficiency and peak load requirements of R.C. 4928.66.

e. The Use of Measure Life Should Not be Restricted as Proposed by the EDUs.

Measure life should not be restricted to TRC calculations.³³ Measure life is very important in that some energy savings projects do end with changes to the system. For example, capacitor banks are moved from to time to time in response to changes in VAR requirements.

f. Information May Not be Available Regarding the Customers Served and the Type of Use.

For some projects, the enhanced level of installation detail is not always available.³⁴

g. The EDUs Propose an Inappropriate Base Line Measure.

The Ohio EDUs disagree with the following TRM statement, "Discount savings with respect to existing equipment over time, to the extent that the EDU would make this (or a similar) change in configuration in the foreseeable future to meet peak load or reliability requirements." However, as mentioned in previous comments by the undersigned parties, the purpose of the energy savings projects is to move past the status quo. This is analogous to the requirements of the energy savings in the home beyond that which is required by the government codes and standards. Thus, the energy savings credited to for T&D projects should only apply if the project goes beyond the status quo

³³ Id.

³⁴ Id

³⁵ Id. at 68.

or business as usual. It does not matter why the project is being constructed or implemented (reliability or capacity). What does matter is whether the solutions being implemented include energy savings beyond their business-as-usual approach to designing and operating power systems. For example, some utilities strive to purchase low loss transformers. These low loss transformers use less energy during their service life. However, there is a higher first cost for these units. As a general rule, large transformers have lower losses than smaller transformers when serving the same load. So if an electric utility replaces a small transformer with a large transformer there will be a reduction in energy losses. However, if the utility had purchased a low loss transformer there would be even more savings. The only legitimate claim of energy reduction is the difference in the business as usual large transformer losses compared to the low loss transformer. The EDU Comments incorrectly suggest that the energy savings start with the overload transformer. The starting point is clearly the status quo that utility would have otherwise have installed. Utility intentions are not the issue. The issue is what normally would have been installed compared to the energy efficient solutions.

Another example is that of a conductor that has insufficient capacity for an increase in loading. A large conductor size is required. If the utility would normally use the largest conductor that can be cost effectively installed on the new pole line to build, then the baseline for loss savings is this largest conductor. The only loss savings that can be claimed will be for a T&D solution which saves more energy than the largest conductor.

h. Primary Line Replacement Should Not be Considered Mass Replacement.

The EDUs question the need for two protocol sections for the analysis of mass plant changes.³⁶ In the TRM, Mass Plant Replacement is divided into two sections, one for simple replacement, and the second is for early replacement of a piece of equipment when no capacity increase is required. By replacing early in its life, the equipment may or may not have been fully depreciated and may have an impact on the rate base of plant in service.

The section of the TRM reference by the EDUs addresses "loss reductions due to installation of mass utility plant with [i..e. having] lower losses than standard equipment." Primary line replacement should not be considered mass replacement. The installation of a conductor replacement project is significantly more costly than other mass plant described in this Protocol. Upstream Loss Factors were not well defined.

i. Loss Reduction Calculations Would be Little Changed by the EDUs' Proposal.

Changing the Protocol to 1000 kVa for loss reduction calculations, as recommended by the EDUs, will have little impact. Such a change may encourage more energy savings projects by reducing the engineering requirements.

³⁶ Id. at 69.

³⁷ TRM at 340.

j. Some Changes are Appropriate Concerning Base and Efficient Cases on Page 345 of the TRM.

The load duration curves of multiple consumers can be summed or the EDUs could substitute a normalized load duration curve for the feeder or substation serving the site. The TRM requires detailed documentation demonstrating that the existing equipment could have remained in service.³⁸ We agree with that this document may not be necessary nor this detailed for a Mass Plant Replacement project.

k. The Large Customer Connection Analysis Protocol Should be Modified to Increase the Limit to 1000 KVA.

The EDU Comments regarding increasing the limit to the large customer connection analysis Protocol should be adopted.³⁹

Average Load Duration Information Should be Substituted When Confidentiality Problems Arise.

Based on the potential of a customer confidentiality problem, an average load duration curve for the class of consumer should be used as a replacement for information on the individual customer.⁴⁰

m. Some Changes are Appropriate Concerning Base and Efficient Cases on Page 353 of the TRM.

As stated earlier in response to EDU issue 10 (response "j" above), the load duration curves of multiple consumers can be summed or the EDUs could substitute a normalized load duration curve for the feeder or substation serving the site. The TRM requires detailed documentation (page 345) demonstrating that the existing equipment

³⁸ TRM at 345.

³⁹ EDU Comments at 70.

⁴⁰ Id.

could have remained in service. We agree with that this document may not be necessary nor this detailed for a Mass Plant Replacement project.

n. Sites that Lack Adequate Data Should Not be Used to Meet Reduction Requirements.

With modern SCADA systems, the vast majority of sites should have hourly load data at the substation.⁴¹ If these sites lack the data, then these projects should not be used to meet the energy efficiency and peak load requirements of R.C. 4928.66.

o. Purported Savings Should Not be Counted if Data
Stated in the System Reconfiguration Analysis Protocol
are Not Provided.

Normalized load duration curves at the substation can be effectively used to meet the following requirement: "Provide the hourly loads on each of the major affected network elements for the last full year prior to the installation of the first element of the project." If the detail data requested in the protocol cannot be provided by an EDU, any purported savings should not be counted.

p. The Proposed Savings for the Voltage Conversion analysis Protocol Should be Rejected.

The EDUs' proposed calculation of the energy savings is overly simplistic and should not be used. We note that most electric utilities use modeling programs to calculate line losses to the power system. These programs yield a more complex and accurate solution. For example, underground cable with internal capacitance will not have a loss reduction based on this simple formula. Further, the full load and no-load losses in step-up and step-down transformers must be modeled differently.

⁴¹ Id. at 71.

⁴² TRM at 356.

issues that have not been satisfactorily resolved could be carried over into a future update of the TRM or set for hearing.

III. CONCLUSION

The changes proposed in the Comments by the OCEA members and in these Reply Comments will aid in the accuracy and transparency of the calculated loss savings. With additional effort and cooperation on the part of Ohio's electric and natural gas utilities, the final TRM will provide a clear path for meeting energy efficiency and peak demand reduction targets.

Respectfully submitted,

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C. Additional Comment on the TRM Should be Invited Outside the Context of a Formal Hearing.

The remaining procedure regarding the development of a final TRM for Ohio should be modified. On October 4, 2010, the Commission found it appropriate to provide interested parties the opportunity to comment upon the draft TRM. The October 4, 2010 Entry followed up on the Commission's early discussion regarding development of a TRM in which the Commission expected the "filing of objections to the consultant's draft of the 2010 TRM, followed by a full hearing on the issues raised in the objections, if and to the extent necessary." A hearing on issues, at least at this point with many outstanding technical inquiries, is not the most productive manner of proceeding to produce a reasonable and comprehensive TRM for Ohio.

The technical comments and reply comments by the undersigned parties and Ohio's utilities should undergo careful consideration for the development of a robust, final TRM. The Commission should permit VEIC time to respond, in written form, to the technical issues raised and recommendations made by the commenting parties. Such a response should address the respective issue raised as well as VEIC's recommendation for resolving the issue (e.g., acceptance, rejection, or another result such as suggesting more research or the collection of Ohio-specific data). VEIC's document could then be used to reduce the areas of disagreement through additional dialogue (e.g. the addition of a technical session) that would involve interested parties and VEIC. Those technical

⁴³ Entry at 2, ¶(6) (October 4, 2010).

⁴⁴ Entry at 5, ¶(9) (June 24, 2008).

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I hereby certify that a copy of these Reply Comments was served on the persons stated below by regular U.S. Mail, postage prepaid, on this 15th day of November 2010.

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