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BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

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

GAS UTILITIES JOINT COMMENTS AND OBJECTIONS REGARDING DRAFT TECHNICAL REFERENCE MANUAL

Pursuant to the Commission's Entry of October 4, 2010, The East Ohio Gas Company d/b/a Dominion East Ohio ("DEO"), Columbia Gas of Ohio, Inc. ("Columbia") Vectren Energy Delivery of Ohio, Inc. ("VEDO") and Duke Energy Ohio, Inc. ("DE-Ohio") (together, the "Gas Utilities") jointly file these consensus comments and objections to the draft Technical Reference Manual ("TRM") docketed on August 6, 2010.

I. COMMENTS

The Commission's October 4, 2010 Entry invited industry stakeholders to file "objections" to the draft TRM. In addition to the specific objections discussed below, the Gas Utilities have several overarching comments that the Commission should also consider.

First, it is important for the Commission to understand that the Gas Utilities do not have the personnel or resources to perform a comprehensive review of the draft TRM. Unlike the electric utilities, the Gas Utilities are not subject to the energy efficiency standards imposed by S.B. 221. Nevertheless, during recent rate cases the Commission approved voluntary energy efficiency programs for all of the Gas Utilities. Some of the energy efficiency programs approved by the Commission include many of the same features included in the draft TRM, including engineering data and measurement and verification. Each of the Gas Utilities

participates in a stakeholder process to develop and administer these programs. As a result of rate case commitments, the Gas Utilities must necessary devote their resources to administering programs already approved through the consensus stakeholder process. The Gas Utilities have therefore focused their review of the draft TRM on specific measures that may effect existing programs.

Second, the Commission should take into consideration the fact that the Gas Utilities are currently in the process of approving, or have recently approved, energy efficiency programs for calendar year 2011. These programs were developed through the stakeholder process. To the extent the Commission requires the Gas Utilities to observe the final version of the TRM, it should not do so until 2012 at the earliest. The Gas Utilities do not believe they should be required to follow the final TRM, for the reasons discussed in earlier comments filed in this docket.

Third, and again assuming the TRM eventually becomes mandatory for the Gas Utilities, the Commission should ensure that it is flexible and inexpensive to administer. There is a cost to gather all of the data so that sponsoring utilities can: (a) produce an application for program approval; (b) demonstrate that the program is cost effective; (c) provide appropriate measurement and verification; (d) develop new programs; (e) annually amend existing programs to meet ongoing requirements; and (f) participate in continuous regulatory proceedings to amend the TRM. Many of these activities may be necessary, but they should be designed to minimize time and cost. The TRM should be a flexible guide, not a static document with prescriptive, inflexible mandates.

The objections that follow should be taken into consideration along with the foregoing comments.

II. OBJECTIONS

Attic Insulation (Draft TRM, p. 36)

Columbia's consultant was unable to match the HDD60 values listed for Toledo, which may point to a similar problem with other city weather data. The consultant downloaded the weather data from the University of Dayton source cited (which is no longer at the URL listed; it has changed to http://academic.udayton.edu/kissock/http/Weather/default.htm) and was unable to match the TRM values. The consultant found an average of 4819 HDD60 per year for the 14 years with at least 360 days of data (it is unclear how the TRM process dealt with missing days from the cited source) yet the TRM lists 4482 HDD60, which is lower than any extended period Columbia could find. The Gas Utilities recommend that the HDD table calculations used throughout the TRM be rechecked and verified.

Showerheads (Draft TRM, p. 93)

The TRM savings are based on one fairly detailed metering study done in Canada, but the savings figure may be too low depending on housing characteristics and program design. The TRM takes measured overall DHW savings of 16 therms from homes with existing showerheads using 2.0-2.5 gallons per minute (gpm) and then divides this by the average 2.1 showerheads per home, and further divides this figure by 1.2 change in gpm (2.45 gpm pre - 1.25 gpm post) to arrive at 6.6 therms per showerhead per gpm reduction as the savings. But that same study found average savings of 31 therms for homes where the existing showerhead flow rate was measured as >2.5 gpm. It appears that those saving would be a larger per showerhead per gpm reduction, although the report does not contain sufficient details, citing "personal communication with the authors" as the source of showers per home. (p. 95, fn. 245.)

The biggest issue here is that 2.1 showerheads per home seems high and would be expected to lead to lower savings per showerhead. Replacing showerheads that people actually use should result in savings greater than the 6.6 therms/yr/gpm. Columbia assumes greater savings of 13 therms/yr/showerhead based on the replacement of showerheads actually used. The draft TRM does not provide a basis for assumptions concerning the second and third showerheads per home.

Additionally, the TRM uses high flow rate assumptions (2.87 gpm existing), which are based on full flow of the showerhead. Columbia's consultant's calculations are based on considerably lower flow rates, which are representative of throttled flow. Using the TRM default flow rate of 2.87 and an assumed new flow rate of 1.6 results in savings of 8.4 therms per showerhead. Adopting the TRM would require the use of the TRM's higher flow rate, resulting in less savings.

Pipe Insulation (Draft TRM, p .97)

The draft TRM calculations appear to be acceptable, assuming that the water heater does not have heat traps to stop thermosiphoning. However, modern water heaters typically have this feature to boost their energy factor (EF) rating. There is a typo (top of p.98 at footnote 251) where the TRM references outside air temperature, where basement (or DHW pipe area) temperature was probably intended. This should be clarified.

Wall Insulation (Draft TRM, p. 100)

The TRM does not accurately describe how to calculate the R value of an insulated wall. According to the TRM, "An R-value of 5 should be assumed for the wall assembly plus the R-value of any existing insulation." (p. 100.) R-5 is a proper assumption for an un-insulated wall, but the wall does not become R-18 when R-13 insulation is added to the stud cavities. The wall

is only about R-13 overall. The TRM should provide a more detailed calculation method based on framing factor assumptions, such as the following formula:

3 + 1/(.25/5 + .75/max(1.6, Rins)), where

3 = R value of the interior and exterior sheathing and air films; this would be added to overall cavity R value estimate.

The denominator of the fraction calculates the U value of the interior of the wall cavity (or UA where Area (A)=1 sq.ft.)

.25 = 25% framing factor, 25% of the wall is framing
5 = R value at framing
.75 = 1- framing factor = fraction of wall area that is cavity
max(1.6, Rins) = 1.6 if there is no cavity insulation, otherwise it equals the R value of the cavity insulation.

The R value of the interior of the wall cavity is calculated as 1/U. This is the second term which is added to the R-3 first term to give total wall R. This would result in R-5 for empty and R-12.4 for R-13 cavity insulation.

Alternatively, the assumed R-value after retrofit should be the rated R value of the cavity insulation. The only directly additive R value would be for insulating sheathing applied to the interior or exterior of the wall surface.

An additional problem with the existing TRM is that both examples show an upgrade to R-20 from wall insulation, which is not representative of what we can be achieved by blown cavity insulation, which is usually done when wall cavities in residential construction are 3.5" to 4" deep.

There is a typo on page 102. In the first sentence beneath the chart at the top of the page, "attic floor" which should be replaced with "wall."

There is the same HDD60 problem as mentioned under attic insulation.

Air Sealing (Draft TRM, p. 104)

The TRM cooling savings from air sealing fails to include latent gains, which would increase savings by 3 or 4 fold over the sensible-only calculations used. For heating savings, the

TRM does not explain where to derive the N factor for estimating natural air leakage. The TRM only provides a cooling N factor. Also, in the heating example, the TRM uses 4569 HDD60 for Toledo but in the table on the prior page the TRM lists 4482. There is also the same HDD60 problem as mentioned under attic insulation.

Duct Sealing (Draft TRM, p.108)

The TRM method 1 appears to make little sense. It uses modified blower door subtraction to calculate the CFM50 of duct leakage, but then treats that leakage as a natural leakage rate – implying a 50Pa pressure difference across the leak all the time. This simplified approach does not consider the location of the ducts, the supply/return split, regain factors, the operation of the system, and many other factors. It leads to low estimates for cooling savings but very high estimates for heating savings – a 171 th/yr savings (nearly 25% of heating) for a small 109 CFM50 reduction in duct leakage. There is no reference to any outside source for such a calculation procedure. The TRM also neglects latent loads associated with the air leakage for cooling.

Additionally, the TRM method 2 relies on rough estimates from a visual inspection and assumes low cooling loads when such measures might be targeted at homes with high cooling loads. The HDD60 table should be reviewed as mentioned previously regarding attic insulation.

Residential new construction (new homes) (Draft TRM, p. 136)

The User Defined Reference Home (UDRH) does not account for clothes washers. Savings from ENERGY STAR clothes washers can be captured and reported along with off-REM coincident peak and related calculations. The TRM should propose values for gas and electric hot water savings as well as direct electric savings from the washer itself.

The TRM should also confirm that the Gas Utilities should use the stated UDRH refrigerator default usage (585 kWh) as shown in the continuation of Table 3 on page 141 under "Lights and Appliances" when a refrigerator is not supplied by the builder. Otherwise, using the RESNET default will result in negative savings relative to the UDRH default.

The TRM should confirm that "0.8 DSE" listed in the continuation of Table 3 on page 141 refers to Duct System Efficiency and that the corresponding UDRH syntax is "DuctLeakageEstimate: Average".

The incremental cost assumptions in Table 4 seems high. The cited Massachusetts-based study may not be a good proxy for new home construction costs in Ohio. Research by Columbia's Residential New Construction program DSM implementer suggests that Ohio incremental costs are likely to be lower.

Water Heaters (Time of Sale) (Draft TRM, pp. 123-24)

The deemed savings for this measure should be clarified. The deemed savings for this measure is shown in the algorithm on page 123 as: Savings ΔMMBtu = 180 * (1/ EFBase - 1/EFEff). However in the reference section on page 124 the algorithm is shown as: ΔMMBtu = BtuHWUSAGE * (1-EFBase / EFEff). The TRM should clarify which algorithm is correct.

III. CONCLUSION

The Gas Utilities appreciate the opportunity to present comments and objections to the draft TRM. A flexible approach to the development of gas energy efficiency portfolios is necessary to achieve accurate results and maximize benefits for customers, consistent with the process currently used by the Gas Utilities.

Respectfully submitted,

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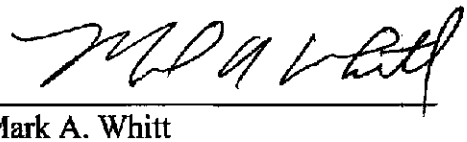

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Gas Utilities' Joint Comments and Objections to the Draft Technical Reference Manual was sent by U.S. mail, postage paid to the following parties on this 3rd day of November, 2010.

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