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April 10, 2012

Via Email: DistributionTransformers-2010-STD-0048@ee.doe.gov

Ms. Brenda Edwards
U.S. Department of Energy
Building Technologies Program
Mailstop EE-2J
EERE-2010-BT-STD-0048
1000 Independence Avenue, SW
Washington, DC 20585-0121

Re: Energy Conservation Standards for Distribution Transformers
Docket No. EERE-2010-BT-STD-0048
(RIN) Number 1904-AC04

Dear Ms. Edwards:

Baltimore Gas and Electric Company (BGE or the Company) appreciates the opportunity to submit comments on the Notice of Proposed Rulemaking (NOPR) for Energy Conservation Standards for Distribution Transformers, which was published by the Department of Energy (DOE or Department) in 77 *Fed. Reg*. 7282 (February 10, 2012).

BGE is a subsidiary of Exelon Corporation and Maryland's largest gas and electric utility. Headquartered in Baltimore, BGE provides service to more than 1.2 million electric customers and more than 650,000 natural gas customers in central Maryland.

BGE strongly supports DOE's energy conservation standards program for consumer products and certain commercial and industrial equipment. We believe the program's value is not just in setting efficiency standards but in determining efficiency levels to ensure that customers who purchase the product save money.

In addition to the comments set forth herein, BGE also supports the comments which will be submitted by the Edison Electric Institute relating to this NOPR.

I. General Comments

BGE would not recommend any changes to the proposed efficiency levels if the revised analysis would show that they are not economically justified. Further, any change in efficiency levels may create supply and reliability problems for the utility Industry.

Unless the effective date of January 1 2016 is revised, BGE would not recommend any effort by DOE that would delay publication of the final rule beyond the proposed date of October 1, 2012 as this lead time is necessary for effective implementation.

II. Comments on Specific Issues Raised by DOE

In the NOPR, DOE requested stakeholders to submit comments regarding thirty issues. Unless otherwise noted here, BGE has no comments.

Issue 1: DOE requests comments on primary and secondary winding configurations on how testing should be required, on efficiency differences related to different winding configurations and on how frequently transformers are operated in various winding configurations.

Response: BGE buys a limited number of dual primary ratio (4kV and 13kV) transformers. These transformers are installed in areas with a 4kV supply. The Company has a program to change all 4kV supply over to 13kV supply. We have no published completion date for this effort but rather we do some changeover each year. The dual ratio transformer allows for easy and quick changeover from 4kV to 13kV with minimal interruption to the customer. While some dual ratio transformers may stay in service at 4kV for many years, the goal is to eventually have all operating at 13kV. BGE recommends that dual winding transformers be tested only in the configuration it is expected to be in during its ultimate (final) use.

Issue 2: DOE requests comment on its proposal to require transformers with multiple nameplate kVA ratings to comply only at those ratings corresponding to passive cooling.

Response: BGE supports the U.S. National Electrical Manufacturers Association's (NEMA) position on this issue.

Issue 3: DOE requests comment on its proposal to maintain the requirement that transformers comply with standards for the BIL rating of the configuration that produces the highest losses.

Response: BGE supports NEMA's position on this issue.

Issue 4: DOE requests comments on its proposal to maintain the current test loading value requirements for all types of distribution transformers.

Response: Generally, actual loading ranges from 25% to 70% depending on the utility practices. Historically, the main reason for the light loading of transformers was the lack of knowledge of actual loads and loading patterns at different times of the year. Therefore, utilities oversized transformers to handle any abnormal conditions. As utilities, such as BGE, upgrade to smart grid devices, they will have accurate real time system load information. This data will allow utilities to increase loading, more efficiently utilize system capacity, and install smaller size transformers.

Issue 7: DOE requests comment on its proposal to maintain the current kVA scope of coverage.

Response: All BGE's transformer purchases are within the current scope. Thus, the Company supports maintaining the current scope. DOE has spent significant efforts developing efficiency levels for each kVA size. BGE supports specifying the best fit efficiency for each kVA transformer.

Issue 8: DOE requests comments on its proposal to continue not to set standards for step up transformers.

Response: BGE agrees that DOE does not need to address step-up/step down transformers. The Company buys very few of this type of transformers (up to 1 per year) and utilizes them only in areas where system voltage cannot be quickly converted or failed supply lines cannot be quickly repaired.

Issue 9: DOE requests comments on the negotiating committee's proposal to establish a separate equipment class for network/vault transformers and on how such transformers might be defined.

Response: Because of the specific issues surrounding transformers installed in vaults and manholes, BGE recommends that these transformers be treated as a separate group. As efficiency requirements increase for these units, so does the size. Transformer sizes, especially in existing vaults and manholes (see photo below), are governed by the size of the vault or manhole. Vaults and manholes are much more prevalent in city environments. Expansion of these vaults or manholes is very unlikely due to space constraints. Transformers in these environments feed large influential loads, thus having a compatible replacement transformer available is essential. BGE supports the Negotiating Team's recommendation and the definition recommended for this type equipment. The Company also recommends that the efficiency level for this type of transformer not be increased from the current levels that have been in effect since January 1, 2010.

Typical Network transformer in a vault

Issue 12: DOE requests comment on whether separate equipment classes are warranted for pole mounted, pad mounted, or other types of liquid-immersed transformers.

Response: The installation of pole mounted transformers is much more challenging than for pad mounted transformers. The nature of the pole mounted transformer – i.e. installed on poles - makes the size and weight of the transformer much more important. As efficiency requirements increase, the size and weight of the pole mounted units increase. Utility poles have a limited load rating before they prematurely fail. This issue is further complicated by the presence of other utilities lines and equipment on shared utility poles. Besides the weight issue, transformer size can also present challenges. Section 23 of the National Electrical Safety Code requires utility lines be separated from other equipment and structures by a specified safe distance (dependent on voltage). As transformers get larger, this “Safety Zone” is breached requiring expensive pole change-outs and equipment relocations. Pole mounted transformers should be treated as a separate equipment class where the specific issues can be properly analyzed and factored into the final decisions on efficiency levels. However, BGE does not support delaying the implementation of these regulations to address this issue at this time.

Issue 13: DOE requests comment on setting standards by BIL rating for liquid-immersed distribution transformers as it currently does for medium voltage, dry-type units.

Response: BGE supports the efficiency standards based on BIL levels. Construction practices limit the ability to reach certain efficiency levels on the higher BUIL-rated transformers. These issues must be taken into account when developing a standard. However, BGE does not support delaying final decision the Final Rule to develop BIL standards.

Issue 15: DOE requests comment on its proposal to scale standards to unanalyzed kVA ratings by fitting a straight line in logarithmic space to selected efficiency levels (EL's) with the understanding that the resulting line may not have a slope equal to 0.75.

Response: BGE recommends the use of real data to determine the outcome for each line. Thus, the 0.75 slope should not drive the results. BGE also supports the analysis of these calculations submitted by John Rossetti of Memphis Light, Gas and Water Division.

Issue 16: DOE seeks comment on symmetric core designs.

Response: BGE recommends that the symmetric core designs not be included in the Final Rule based on the previous comments highlighting significant issues with the proposed designs.

Issue 17: DOE seeks comment on nanotechnology composites and their potential use for distribution transformers.

Response: BGE recommends that, due to the lack of availability of this technology, it should not be included in DOE's Final Rule.

Issue 18: DOE requests comment on its materials prices for both the 2010 and 2011 cases.

Response: BGE recommends that base costs, for both material and wholesale energy, should reflect from the most recent published data for the most recent year.

Issue 19: DOE requests comment on the current and future availabilities of high-grade steels, particularly amorphous and mechanically-scribed steel in the United States.

Response: BGE is very concerned regarding the availability of a quality steel supply for the transformer manufacturing industry. Limited supply of transformers will have a

significant negative effect on BGE's ability to provide safe and reliable electric service to its customers.

Issue 20: DOE requests comment on particular applications in which transformer size and weight are likely to be a constraint and any data that may be used to characterize the problem.

Response: Any transformer design that is currently installed in constrained areas or spaces presents a problem if it needs to be replaced by a larger or heavier design. In particular, Network and Vault type liquid filled transformers present the most replacement challenges due to the limitations of the existing vaults and manholes. Dry type transformers present similar problems. Customer provided space for these transformers is limited due to the value of real estate. In addition, typical installation of dry type transformers is on the upper levels of high rise buildings. Replacement of dry type transformers require transport on existing elevators, which have weight and size constraints. Thus, designs that increase the size and weight of dry type transformers could prohibit replacement of existing units.

The third category for consideration is pole mounted liquid filled transformers. Increasing the weight of these units may force a complete pole replacement to handle the additional load and meet the requirements of Section 25 of the National Electrical Safety Code. Likewise, size increases could cause ~~a violation of~~ safety clearance issues which would also trigger replacement with a larger pole pursuant Section 23 of the National Electrical Safety Code. A photo of a typical pole installation in a downtown Baltimore City alley is shown below. The constraints on pole installations in today's world are significant. In some circumstances, BGE shares the utility pole with telecommunication carriers, cable television, special interest groups, and government agencies. These additional occupancies, along with the traditional utility needs, make maintaining the pole integrity and safety clearances on the pole extremely challenging. The value of the incremental energy saved is minor compared to the cost of a potential injury or electrocution due to a failed pole or a clearance ~~violation~~issue.

Alley in Downtown Baltimore City

Every mandated increase in the efficiency level of transformers affects the weight and size of the transformer which creates installation challenges in the field. Resolution of those challenges is normally very costly and time consuming.

Issue 21: DOE requests comment on its steel supply availability analysis, presented in Appendix 3A of the TSD.

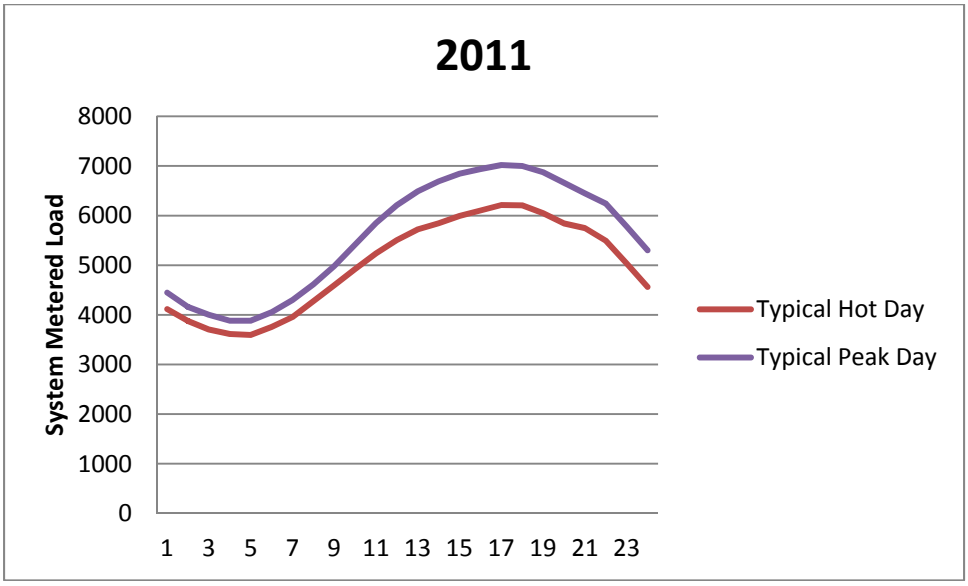
Response: BGE remains concerned about the availability of core steel if DOE should decide to raise transformer efficiency levels past those recommended in the NOPR. DOE's life cycle analysis has shown the point where domestic steelmakers are no longer competitive and surpassing that level may present significant issues for the industry. Likewise, overseas procurement of steel could present specification issues. BGE is concerned regarding setting a standard which would require the use of specific core steel that is not readily available in the domestic market and which does not have a proven track record. This could have a negative impact on the electric grid.

Issue 22: DOE seeks comment on its proposed additional distribution channel for liquid-immersed transformers that estimates that approximately 80% of transformers are sold by manufacturers directly to utilities.

Response: While price negotiations are usually done directly between the manufacturer and the utility, in BGE's experience, many transformer manufacturers will hire local representatives to provide customer service in order to respond quickly to any issues.

Issue 23: DOE seeks comment on any additional sources of distribution transformer load data that could be used to validate the Energy Use and End-Use Load Characterization analysis. DOE is specifically interested in additional load data for higher capacity three-phase distribution transformers.

Response: Below a typical summer load curve for BGE.



Issue 24: DOE seeks comment on its pole replacement methodology that is used to estimate increased installation costs resulting from increased transformer weight due to the proposed standards.

Response: DOE's methodology may not reflect the true costs of pole change-outs. Pole replacement costs quoted by industry experts are estimates or reflect actual costs from previous years. In BGE's experience, actual costs tend to exceed the estimates by a significant amount (20%-60%). In 2011, the average pole replacement cost for poles with transformers was $5,750. This estimate does not include the cost of the transformer but includes the cost of the new pole along with any replacement material used during the installation. As to the magnitude of pole replacements, in 2009, BGE

adopted the January 1, 2010 DOE efficiency standards. The number of pole replacements with transformers on the poles increased by 48% in 2009 from the 2008 level. During this same time period, the average cost of replacing a pole with a transformer increased by 10%. There are also additional costs relating to the increased weight of a transformer. Heavier transformers also present installation challenges. Larger kVA transformers are already above the lifting capacity of utility vehicles. Truck lifting capacities vary depending on the distance between the truck and the pole. Utility material handling bucket trucks have a 660 lb. limit when 4'-6' from the pole. Having to utilize larger, heavier duty lifting equipment increases the cost of the installation. This is reflected in the extra manpower needed (special training requirements for the larger crane operators along with trained riggers and safety spotters is required by OSHA), special permitting for the larger vehicles, road or lane closure permitting and flagging and safety "set ups".

Issue 25: DOE seeks comment on recent changes to utility distribution transformer purchase practices that would lead to the purchase of a refurbished, specifically re-wound, distribution transformer over the purchase of a new distribution transformer.

Response: BGE has not changed its purchasing practices for distribution transformers at this time. If new transformer requirements significantly increase costs, BGE may consider purchasing refurbished designs to address the size and weight problems previously discussed. Further, BGE may also consider purchasing replacement transformers that would not require the costly installation practices associated with the heavier and larger designs. Generally, BGE only considers re-winding larger, station type, transformers. This decision is both cost and "delivery lead-time" driven. The Company does refurbish distribution transformers returned from the field. BGE's guidelines state that if the transformer is less than 20 years old and if the refurbishment cost is less than 20% of a new transformer, then the Company will refurbish the transformer. This is done in-house and consists of cosmetic corrections or bushing replacements. As the cost of new transformers increases, so does the number of refurbished transformers. In 2011, BGE refurbished approximately 18% of the transformers returned from the field.

Issue 26: DOE seeks comments on the equipment lifetimes of refurbished, specifically re-wound distribution transformers and how it compares to that of a new distribution transformer.

Response: BGE considers a re-wound transformer to be a new transformer and would expect the life of the transformer to be equivalent to a new unit. Rewound transformers typically come with the same warranty as a new transformer. Refurbishments, unlike total rewinds, do not restore the transformer to a life expectancy of a new transformer.

BGE has maintenance programs that help ensure a full life for in-service transformers. This program is focused mainly on pad mounted and vault/network type transformers. As the cost of replacement transformers increase, utilities will be inclined to adopt or improve programs to extend the life of their existing units.

Issue 28: DOE requests comment on the possibility of reduced equipment utility or performance resulting from today's proposed standards, particularly the risk of reducing the ability to perform periodic maintenance and the risk of increasing vibration and acoustic noise.

Response: Currently vaults or transformer rooms for network, vault type and dry type transformers are designed to allow for proper ventilation, maintenance and the safe operability of the transformers in the vaults/transform rooms. Any increase in size of the transformers housed in these containment areas infringes on the space designed specifically for these functions. In the worst case, the reduced space causes safety issues in operating and maintaining the transformer or may prohibit the utility's ability to operate or maintain the equipment completely. In this case the transformers must be de-energized remotely which could require additional outages and service interruptions to customers not directly fed by the transformers. As room on the utility pole decreases, so does the separation from other utility equipment, making work on the pole by electric and communication workers more dangerous. Please see photo under Issue #20 showing typical congestion on an urban utility pole.

Dry type transformers are traditionally used in high rise buildings and may be installed in rooms next to apartments. In BGE's experience, dry type transformers have caused vibration and noise issues with the customers.

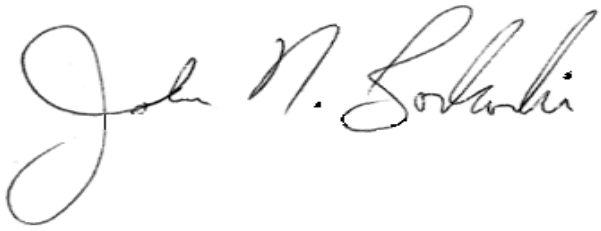
Issue 29: DOE requests comment and corroborating data on how often distribution transformers are operated with their primary and secondary windings in different configurations and on the magnitude of additional losses in less efficient configurations.

Response: BGE buys a limited number of dual primary ratio (4kV and 13kV) transformers. These transformers are installed in areas with a 4kV supply. BGE has a program to change all 4kV supply over to 13kV supply. We have no published completion date for this effort but rather we do some changeover each year. The dual ratio transformer allows for easy and quick changeover from 4kV to 13kV with minimal interruption to the customer. In our case, while some dual ratio transformers may stay in service at 4kV for many years, the goal is to eventually have all operating at 13kV.

Issue 30: DOE requests comments on impedance values and on any related parameters (e.g., inrush current, X/R ratio) that may be used in evaluation of distribution transformers. DOE requests particular comment on how any of those parameters may be affected by energy conservation standards of today's proposed levels or higher.

Response: When installing single phase transformers (normally "round can" pole top units) banked to provide multiphase service, BGE must ensure that the impedances of the banked single phase units are matched. If they are not matched, then the utility would not be able to ensure that the load is balanced between the transformers (i.e. the lower impedance transformer would hog the load). The resulting circulating currents would lead to premature transformer failure and also could interfere with the operation of the customer's three phase equipment. If higher efficiency transformer requirements drive impedances outside the IEEE required range, then utilities would be required to change out the entire bank of transformers, even if only one transformer fails, to ensure matching impedances and a safe, reliable installation. BGE has experienced issues when the impedances of banked transformers are not matched. Currently, the Company specifies the impedance for transformers purchased for this type of installation.

Respectfully Submitted,



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