ComEd
An Exelon Company

Date: April 18, 2011

To: Ms. Brenda Edwards
U.S. Department of Energy, Building Technologies Program
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cc: Michelle Blaise (VP, ComEd Engineering & Project Management)
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Subject: Notice of Public Meeting (NOPM) for Energy Conservation Standards for Distribution Transformers, DOE Docket # EERE–2010–BT–STD– 0048 and RIN 1904–AC04

Dear Ms. Edwards,

In a letter dated September 26, 2006, Exelon (the parent company to ComEd) supported the current DOE distribution transformer efficiency standard which is consistent with Exelon's vision for environmental stewardship.

It is difficult to determine the magnitude of the impact of increases to the current minimum transformer efficiencies with any certainty to existing transformer designs until the final efficiencies are issued. ComEd has hundreds of transformer stock codes that will need to be re-designed. ComEd has spoken with various transformer manufacturers, and the magnitude of the impact on the design depends on the type of transformer and where it is installed.

ComEd annually adds or replaces approximately 2.5% of its transformer population per year (approximately 12,000 transformers per year of a total population of approximately 500,000 transformers).

Higher efficiency transformer designs will be larger and heavier than current designs. This will have some impact on the cost and resources required to perform transformer replacements due to:

- Pole loading
- Foundation limitations
- Vault space constraints
- Floor loading
- Elevator load limitations

For street & building vaults, a slightly larger transformer would potentially cause severe problems when replacing an existing transformer with respect to the equipment openings, operating clearances, and the loading capacity of floors and elevators used to transport the transformer to the vaults.

Street/Sidewalk Vaults

The street/sidewalk vaults are typically owned by ComEd. These vaults are typically used for secondary network system applications and have a large standard opening for equipment. A slightly larger transformer as a result of increased efficiency should not be an issue as far as replacing an existing transformer. However, there is a larger probability that a slightly larger transformer installed in an existing street/sidewalk vault may violate certain company operating clearances inside the vault and possibly be deemed a safety issue.

Building Vaults

The building vaults are designed on an individual basis. The equipment opening is designed to meet the customer's ultimate transformer capacity requirement.

ComEd utilizes a table of dimensions and weights based on historical transformer designs of different sizes used as a guide to determine the size of equipment opening needed to meet the ultimate transformer capacity requirement.

The building vault structure is owned by the customer. The customer typically provides the smallest vault possible that still meets the ComEd requirements in order to reduce costs. The equipment opening is designed to meet the ultimate transformer capacity requirement with a typical clearance of only a few inches. Additionally, larger transformers may not be able to be maneuvered through building hallways.

- A slightly larger transformer as a result of increased efficiency would potentially cause severe problems when replacing an existing transformer with respect to the equipment opening.
- A slightly larger transformer as a result of increased efficiency installed in an existing building vault may violate certain company operating clearances inside the vault and possibly be deemed a safety issue.
- A slightly heavier transformer as a result of increased efficiency may cause severe problems if it exceeds the loading capacity of floors and elevators used to transport the transformer to the vault.

The customer would have the burden of providing a larger opening and facilities (elevators and floors) needed to support a larger and heavier transformer which may result in an extended outage and a large cost incurred by the customer.

ComEd's network transformer limiting dimensions and weights are as follows:

12 kV & 13.2Y/7.6kV	Maximum Overall Dimensions - Inches			Max. Total Weight (lbs.)
kVA	Height	Length	Width	
500	72	80	42	7200
750	74	82	42	9000
1000	76	84	46	10,800
1500	76	86	51	13,500
2000	80	92	51	16,800
2500	86	96	51	20,000
34kV				
750	84	96	49	11,000
1000	84	98	52	12,800
1500	86	100	58	16,000
2000	88	102	64	19,000
2500	94	104	70	22,500

ComEd's indoor dry-type (no insulating oil) transformer limiting dimensions and weights are too numerous to be listed in this document.

For transformers installed on poles, an increase in transformer weight may generate, depending on transformer size, an increase in the required pole class to sustain the load.

Following the implementation of transformer efficiencies mandated by Final Rule dated October 12, 2007, ComEd determined that there are varying design capabilities of transformer manufacturers to meet the size and weight limitations of our existing infrastructure. In some cases, we have had to single source transformer designs.

Some specific situations may generate additional line work to meet National Electrical Safety Code (NESC) line clearances. The NESC "grandfathers" clearances including transformer change outs unless the pole is being changed for another reason. As such, the transformer can be replaced without changing the existing clearance requirements provided the replacement of the transformer does not also require replacement of the pole. If it did, the clearance at the pole location would no longer be "grandfathered" and require additional re-work not only of that pole but adjacent poles.

Some significant single phase overhead transformer design limitations are as follows:

- ComEd cluster mounts up to three single phase 500 kVA overhead transformers on a single pole. ComEd's current vertical pole loading limit is 10,800 lbs. ComEd's single phase overhead transformer specification has a maximum weight limit of 3,600 lbs. An increase in transformer weight above 3,600 lbs will require poles with an increased vertical pole loading limit or will require possible platform mounting of three phase transformer banks. In applications where transformer banks are currently cluster mounted, platform mounting may not be feasible due to available space.
- ComEd's single phase overhead transformer specification has an allowable impedance range of 5.3% - 6.2% for 250 kVA, 333 kVA, and 500 kVA transformers. Manufacturers are already having challenges with transformer designs that meet the efficiencies required in the Final Rule dated October 12, 2007 and the minimum impedance requirement of 5.3%.

In addition, ComEd believes that certain pad mounted transformers may require foundation upgrades. Due to the more extensive nature of these repairs, generator deployment will likely be necessary to maintain customer services.

Supporting documents

"Dist Tr Efficiency
Letter to DOE 09-2

Sincerely,

Peter Tyschenko