Transformer Manufacturing Association of America

March 27, 2023

Via electronic filing
(DistributionTransformers2019STD0018@ee.doe.gov)

United States Department of Energy
Office of Energy Efficiency and Renewable Energy
1000 Independence Ave., SW
Washington, DC 20585

Re: Comments of the Transformer Manufacturing Association of America in DOE Notice of Proposed Rulemaking Number EERE-2019-BT-STD-0018

To Whom It May Concern:

The Transformer Manufacturing Association of America ("TMAA" or the "Association") is filing these comments on behalf of its members in response to the Notice of Proposed Rulemaking released on January 11, 2023 ("NOPR") issued by the Department of Energy ("DOE") Office of Energy Efficiency and Renewable Energy ("Department"). The TMAA appreciates the opportunity to provide the perspective of its members on the proposed rule changes, which will have a substantial and potentially negative impact on transformer manufacturers and national security.

The TMAA outlines herein its perspective as the voice of the domestic transformer industry on these important topics. To be certain, the issues affecting the ability of the domestic transformer manufacturers to meet customer demand with modern, highly efficient equipment is incredibly complex. These comments do not attempt to outline all these complicated issues, and the TMAA reserves the ability to respond to other comments and proposals as necessary.

I. THE TMAA

a. Our Members

The TMAA is the voice representing the interests of domestic transformer manufacturing in the United States to government officials and policymakers. Our members make up the bulk of the domestic small, medium, and large power transformer producers and their suppliers, with manufacturing facilities throughout the United States representing nearly ten thousand hard-working American employees in numerous states and tens of thousands of sub-supplier employees.

Our members' equipment supplies electricity to customers in all sectors of the American economy, including U.S. armed forces military bases; emergency first responders; federal, state and local governments; electric utilities; hospitals; emergency services; renewable energy projects; data centers; electrical contractors; heavy manufacturing; railroads; smelters and others.

One common theme through ALL members of the transformer manufacturing industry that operate manufacturing plants in the United States is that they each rely on a vibrant, competitive and diverse international marketplace for purchasing their critical raw materials at globally competitive prices. As several other commenters have noted, the distribution transformer sector is experiencing unprecedented demand causing its supply vendors to have trouble meeting the current needs. Among other reasons, demand is extremely high due to the aging nature of the current infrastructure and the development of renewable generation projects - both requiring new, modern transformers to carry the load. This supply chain constraint has resulted in lead-time delays and higher costs, to the point where it is now taking years to deliver a complete distribution transformer even though manufacturers are running at maximum capacity to meet this demand.

b. TMAA Overview of Proposed Rules

The TMAA is concerned that the proposed rules, while well intentioned, will force transformer manufacturers to undergo expensive and untimely retooling of their manufacturing lines and develop an entirely new supply chain at the very time when the sector is already suffering from supply chain constraints and lead-time delays. This disruption to the domestic supply chain will exasperate the current supply chain issues, leading to even longer lead-time delays and increased costs. These increased costs will pass through to consumers in the form of higher distribution and wire charges.

The disruption will also result in enhancing reliance on international sources of transformers and materials to meet the demand for this vital component of the electric grid, which could have substantial national security implications. As President Biden noted in his June 6, 2022, Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, transformers are "critical technology items essential for national security" and, as such, "action to expand the domestic production capability for transformers and electric grid components is necessary to avert" a shortfall that would "severely impair national defense capability".

The TMAA respectfully suggests that the more appropriate use of resources in this time of supply chain constraints is to retain the current efficiency standards and expand the domestic production capabilities of transformer manufacturers. The DOE has programs available that could help finance the expansion of additional transformer production facilities in the US, thereby limiting reliance on international imports and lowering our national security risks, while securing new, well-paying jobs for Americans. In addition, in his June 6, 2022, Determination, the President authorized the use of Defense Production Act programs to expand the domestic production of transformers and electric grid components. The TMAA stands ready to work with the DOE to utilize these tools, mitigate the supply chain constraints and enhance our national security.

II. Impact of the Proposed Rules on Transformer Production Costs

As other commenters such as Prolec GE and ERMCO have noted, the proposed efficiency levels would require transformer manufacturers to undertake a substantial shift in the materials used

inside a transformer, mainly on core materials. Prolec GE notes that the only way transformer manufacturers could comply for certain sized units is to create a new category of supply chain based not upon traditional GOES, but upon amorphous metal cores. In addition, in order to meet these proposed efficiency standards, domestic transformer manufacturers will be required to make a significant investment for the acquisition of copper supply and new manufacturing equipment, including cutting machines and annealing ovens. Finally, the production facilities themselves will need to be shut down for some period of time while the production lines are modified to account for these new processes and equipment.

Each of these facts substantially increases the cost of producing the underlying transformer. Further, the proposed standards presume a viable domestic market exists in which transformer manufacturers can acquire enough amorphous steel cores at a volume to meet needs. As Prolec GE points out in its comments, full conversion to amorphous metal cores is not realistic based on the present and projected supply capacity of amorphous cores. The gap in the supply of amorphous metal will force domestic transformer manufacturers to continue using GOES cores, resulting in a substantial increase in the size and weight of the transformers and increasing the incremental cost to build and transport units. Prolec GE estimates the increase in the cost of a compliant transformer using GOES to be between 40% and 70%.

Also, to comply with the proposed standards, designs with GOES cores are more likely to need at least one of the windings to be made from copper, compared with amorphous metal designs that can use aluminum in both windings. As an example, Prolec GE points out in its comments that three-phase transformers with ratings above 1500 kVA cannot use GOES and meet the proposed efficiency standard, even with the use of all copper windings. Rather, for this size transformer to meet the proposed standards, the manufacturer will be required to use amorphous metal, which is not a technically proven option for units larger than 2500 kVa. Thus, for transformers larger than 2500 kVa, it is not clear the manufacturers can achieve compliance with the new mandates even using amorphous metal. For the smaller units, it is unknown whether there is adequate amorphous metal or copper supply available to meet this new demand.

Each of these issues will increase the cost of producing and delivering a transformer that could comply with the proposed standards (to the extent compliance is possible given the size of the unit). Consumers will ultimately bear these substantially higher costs to produce a compliant transformer.

III. Impact of the Proposed Rules on Supply Chain

As other commenters have noted, the only domestic producer of GOES has stated that it does not have investment plans to the extent necessary to develop and produce the premium grades of GOES needed to produce the higher efficiency transformer designs compliant with the proposed standards. Thus, the proposed increase in efficiency standards will force the domestic transformer manufacturers into the international market to procure the grade and quality of GOES required to meet the new efficiency standards. However, international suppliers of premium GOES grades

indicate that they have committed part of their production capacity of these grades to their domestic markets, thus making such supply unavailable to support changes in the U.S. transformer market.

As noted, the proposed standards will require transformer manufacturers to develop an entirely new supply chain system to migrate their current production line processes to utilize amorphous metal in their cores. Additionally, regarding supply of amorphous metal raw material (ribbon) and finished cores, it does not appear that the current U.S. manufacturing capabilities would be able to meet the projected demand of distribution transformers for the U.S. market, even taking into account planned capacity expansions. As with GOES, the proposed increase in efficiency standards will force the domestic transformer manufacturers into the international markets to procure the grade and quality of amorphous metal required to meet the new efficiency standards.

This situation is untenable from the perspective of securing a thriving domestic supply chain. This situation also reinforces reliance on an international supply chain, including countries that are not friendly to the U.S. and is, as such, a threat to our national security. The proposed standards will cause delays or interruptions in the supply chain, increase costs and vulnerabilities related to the distance material will need to travel and ultimately increase prices that passed through to end-user customers.

IV. Economic impact for consumers

The DOE Engineering Analysis supporting its proposed efficiency standard, which assumes an unrealistic scenario of 100% of designs using amorphous metal cores, is neither technologically nor economically feasible for the reasons detailed above. The significant increases in incremental costs of distribution transformers that will result if the Department adopts the proposed efficiency standards will increase costs the utilities will incur to purchase compliant transformers. The utilities, in turn, will pass these increased costs through to customers in the form of higher distribution costs. The nature and scope of these costs will depend on the final rules, but as proposed, the proposed standards will substantially increase the manufacturers' costs, which will fall on the pocketbooks of the consumers.

In summary, TMAA respectfully suggests that the present market and global supply chain conditions are not favorable for the implementation of new efficiency levels for distribution transformers. A more responsible policy is to direct any investments to increase the domestic transformer manufacturing capacity to supply more distribution transformers to meet the current and forecasted demand from utilities, renewable project developers and industrial companies at the current efficiency levels. In order to comply with these proposed mandates, manufacturers will be required to replace substantial manufacturing equipment, convert their product lines and develop entirely new supply chains for amorphous metals (raw ribbon and finished cores), a time consuming and expensive process requiring the manufacturer to pass through the resulting costs to the transformer purchaser and, ultimately, to the end-user consumer. In light of the ongoing supply chain constraints and lead-time delays experienced in the current market, the TMAA encourages the Department to focus its efforts on supporting these capacity expansion projects.

The TMAA stands ready to help the Department advance such endeavors.

Sincerely yours,

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