



October 1, 2015

TO: Patricia Hoffman, Assistant Secretary
U.S. Department of Energy, Office of Electricity Delivery & Energy Reliability

FROM: Tom Sloan, Kansas State Representative
Jeff Morris, Washington State Representative

RE: RFI Regarding a Possible National Transformer Reserve Program

Thank you for allowing us the opportunity to respond to the Request for Information (RFI) on the establishment of a national reserve of power transformers that support the bulk power grid.

We offer you our bipartisan perspective as a Democrat from Washington State and a Republican from Kansas. Together we represent almost 40 years of experience in Energy policy making at the State level. In addition, we both have been members of the DOE's Electricity Advisory Committee, and we currently have major roles in the energy policy programs of the National Conference of State Legislatures and the Council of State Governments.

You have asked, "Is there a need for a National Power Transformer Reserve?"

We concur with the comment submitted by others that we need only to look at the impact of severe weather events to identify the seriousness of the question. From the silver thaw in Quebec in the 1990s to the devastation of Hurricane Sandy and the regular typhoons and tornados packing hurricane force winds that Washington and Kansas citizens call bad weather, national electric grid resiliency and reliability require being prepared for any emergency.

The evidence of economic damage from weather and global political instability further suggests that we must also be prepared for a strategic attack on our electric infrastructure. State and local utility resources are too small to quickly and adequately respond to such an event.

The cascading economic impact of a strategic attack on a regional electric infrastructure would result in severe national implications for such other energy infrastructures as oil refineries and natural gas pipelines; health care delivery systems; telecommunications providers; and loss of public confidence that far transcend the local impact.

Recommendation 1: We recommend that the US Department of Energy (DOE) first examine and utilize existing mutual assistance programs developed by private and non-profit organizations to provide manpower, rolling stock, and infrastructure assets to meet emergencies. While these efforts are laudable, they often are focused on delivering to their member's needs, rather than to a larger geographic and multi-utility area. The DOE should work to fill in gaps between private and public groups, and work to expand regional and national/North American mutual assistance compacts. The first step might be to convene a Summit of mutual assistance organizations, develop a matrix of resources regularly available for dispatch, develop a timeline for arrival and service restoration, and collaboratively develop the communications systems and inventory identification techniques necessary to meet unanticipated demands.

Recommendation 1a: Some of the voluntary infrastructure lending agreements have been challenged as utilities further down the anticipated storm path were hesitant to deploy assets if they felt they might also be hit by that same weather event a few days later. This has necessitated resources being moved hundreds of miles from utilities that were not experiencing that weather pattern. The additional coordination and movement of resources delayed restoration of service. The DOE can assist by ensuring that the mutual assistance agreements provide that if a utility responds to the needs of its neighbor and subsequently has service problems itself, its neighboring utilities away from the storm path will respond quickly with the necessary resources.

You also asked, "Are there alternatives to a Power Transformer Reserve Program?" We see several different approaches to augment, not supplant, mutual assistance agreements that can partially offset the problems attendant to establishing a National Power Transformer Reserve.

Recommendation 2: Many of the transformers being discussed are one off designs built for large interconnections. While a national reserve might be able to supply temporary service, long term reliability would only be accomplished by having transformers made to exact specifications for that intertie. The DOE and its National Laboratories would serve grid resiliency and reliability by helping utilities and manufacturers move toward more standardized or uniform large transformer designs. Such standardization would facilitate significantly the success of mutual assistance programs.

Recommendation 3: For a variety of economic and regulatory reasons, including the amount of toxins involved in manufacturing transformers, much if not all of this manufacturing has moved off shore. The paucity of manufacturers, combined with long lead and transportation times, makes standardization of design even more important. DOE and National Laboratories support and investment in advanced research to identify cleaner transformers would encourage U.S. businesses and environmental agencies/organizations to support constructing large transformers domestically. Such manufacturing would improve grid reliability and resiliency.

Recommendation 4: Just as back-up electric generators must be maintained and "fired" periodically to ensure that they will perform when needed, so too the issue of stored transformer degradation must be addressed. Whether additional research will identify technologies similar to some types of batteries in which the activation fluid is added at the time of purchase/use that can be used in transformers or transformers in a National Power Transformer Reserve would be periodically "exercised" to ensure performance on demand, it is clear that further DOE and National Laboratory research is necessary.

Recommendation 5: The DOE and National Laboratories are encouraged to explore and model alternatives to a National Transformer Reserve Program. For example, increased development of redundant high voltage transmission lines, especially utilizing such new technologies as BOLD and synchrophasers; micro-gridding within urban communities with such large institutions as grocery stores, big box stores, and National Guard facilities acting as anchors; and integration of natural gas pipelines with small “peaking” generators could provide some of the benefits of a National Transformer Reserve Program without the problems associated with storing dissimilar transformers. The above suggestions, if modeled for regional energy security, may provide enhanced benefits sought by the DOE, state officials, and electricity consumers.

Recommendation 6: Finally, while the RFI and our responses have focused on the United States acting either regionally or nationally, it is important to note that our electric grid is integrated with Canada’s and Mexico’s. It is logical to coordinate such U.S., Canadian, and Mexican resiliency planning, whether through a transformer reserve, improved high voltage transmission system, or other security response(s) with our hemispheric neighbors in ways that protect sovereignty while making us collectively more resilient.

We commend the DOE for seeking input on these questions and appreciate your considering our humble thoughts.

Sincerely,



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