

Friday, April 14, 2017 11:47 AM CT

DOE recommends industry management of spare transformer reserve

SNL

By [Molly Christian](#)

In a newly released report, the U.S. Department of Energy said industry rather than government should oversee a strategic transformer reserve program to help utilities recover from natural disasters, cyber or physical attacks, and other widespread transformer failures.

That industry-based option should be driven by voluntary actions, as well as FERC-approved North American Electric Reliability Corp. standards, DOE said. But the report suggested that FERC and electric power industry partners reassess DOE's recommended approach within a year to see if they should continue with it or seek alternative government actions.

"Establishing a wholly federally-owned reserve, with DOE as the lead federal agency, would face a significant number of challenges with respect to cost, location, transportation, maintenance, potential adverse market effects and industry acceptability," DOE said.

The report projected that buying transformers alone would cost the U.S. government at least \$450 million, using a midpoint transformer price of \$4.5 million and an estimated need of 100 transformers to cover the wide range of required [voltages](#). Total costs for a federal program would rise to \$500 million after adding transportation and storage, security, routine testing, maintenance and other expenses.

Congress required DOE to conduct the study as part of a large transportation [bill](#), known as the Fixing America's Surface Transportation Act, or FAST Act, which then-President Barack Obama [signed](#) into law in December 2015.

Large power transformers are a crucial part of the electric power transmission and distribution system, but they are costly and difficult to replace in the event of high-impact, low-probability events such as geomagnetic disturbances, earthquakes, a large electromagnetic pulse weapon attack, or multiple physical or cyber attacks. In its new report, DOE said equipment such as large power transformers could take "months, if not years" to replace, driving the need for a spare transformer reserve.

Shortly before the FAST Act's passage, DOE's Office of Electricity Delivery and Energy Reliability sought public input on forming of a strategic national transformer reserve in response to recommendations in the department's 2015 Quadrennial Energy Review.

Respondents, including states and power industry members, recommended that any national reserve be owned and managed by industry, which would allow utilities to leverage their expertise and vendor relationships and better incorporate those investments in their resource planning. Respondents, however, were mixed on whether the government should provide funding for that program.

DOE pointed out in its new report that individual utilities already have a number of initiatives underway for stocking spare transformers and related equipment, including keeping interchangeable spares and

retiring some transformers early so they can be held as spares. In addition, ISO/RTOs may require spare transformer inventories or direct owners and operators to maintain spare equipment.

Several larger-scale industry collaborations also exist. The Edison Electric Institute, an advocacy group for investor-owned utilities, created the Spare Transformer Equipment Program, or STEP, which requires participating utilities to maintain and sometimes acquire a specific number of up to 500-kV transformers that can be available to other utilities in the event of a critical substation failure.

Another high-profile effort is the industry-formed [Grid Assurance](#) program, which aims to build a 100-transformer inventory that can be quickly deployed in emergencies. Grid Assurance is expected to be "fully functional" by January 2018, the DOE report said.

Despite the emphasis on industry action, DOE proposed several ways it could collaborate on building spare transformer reserves. The department said it could work closely with industry to assess the resilience of critical transformers, as identified by NERC in its [CIP-014](#) standard.

DOE could also create threat and impact scenarios for specific regions to help guide NERC performance-based standards, establish performance standards that reflect progress toward resiliency, support grants or other funding mechanisms to spur regional cooperation on sparing programs; provide technical support and other incentives for smaller utilities and electric cooperatives, and coordinate with the industry-led Transformer Transportation Working Group to optimize transportation planning in the event of a grid emergency.

The report was conducted by DOE's Office of Electricity Delivery and Energy Reliability, which oversees much of the agency's work on grid security. The Trump administration has proposed [limiting](#) funding for that and other DOE offices as part of an effort to reduce federal non-military spending.

But power industry representatives said they are confident the Trump administration will support cyber and other security efforts for the power sector.

Cybersecurity is one of Energy Secretary Rick Perry's top priorities, said Scott Aaronson, EEI's executive director for security and business continuity. "I'm generally confident that the functions of the [Office of Electricity Delivery] and focus on cybersecurity will continue to be a priority," he said.

Aaronson added that EEI viewed DOE's new transformer report favorably and said it recognized that government "shouldn't conflict with or duplicate" industry's efforts