

**Talking Points for Assistant Secretary Bruce J. Walker  
Office of Electricity**

**2018 Southeastern Association of Regulatory Utility Commissioners  
(SEARUC) Conference**

**Monday, June 11, 2018**

**Remarks 9:15 – 9:35 AM**

Thank you, Swain, for that introduction . . . and for inviting the Department of Energy to participate in the 2018 SEARUC Conference – “*Effective Utility Regulation – All in the Public Interest!*” I’ll go ahead and leave the regulation talk to all the experts here in the room, but . . . “all in the public interest” . . . that’s a bit more in my wheelhouse.

The Department of Energy is focused on the public interest by ensuring that the energy infrastructure is capable of securing our national security. Therefore, the resilience and reliability of the Nation’s electric grid is of the utmost importance. And when looking at those issues through a Federal lens, there are three main entities—the North American Electric Reliability Corporation focused on reliability; the Federal Energy Regulatory Commission focused on markets; and DOE focused on the national security of the grid.

There are 16 critical infrastructure sectors as defined by the Department of Homeland Security, each which rely upon the energy provided from

the energy sector. As set forth in Presidential Policy Directive – 21, DOE is the sector-specific agency for critical energy infrastructure. Additionally, the FAST Act further codified that DOE is the Sector-Specific Agency for Cybersecurity in the Energy Sector while also mandating the Secretary of the Department of Energy identify Defense Critical Electric Infrastructure.

Using the definition set forth in PPD-21; **resilience** is defined as **“the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruption. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.”**

The President’s National Security Strategy highlights that “the vulnerability of U.S. critical infrastructure to cyber, physical, and electromagnetic attacks means that adversaries could disrupt military command and control, banking and financial operations, the electric grid and means of communication.” As a national security agency, DOE takes a comprehensive, Intelligence Community informed view of resilience, recognizing the energy sector has been the main focus of cyber and physical threat attacks. I’d like to take a few moments this morning to talk about how DOE, and my office specifically, is approaching resilience and reliability in a national security context.

As most folks here in the room know, the first report Secretary Perry directed staff to undertake upon his confirmation was one assessing the reliability and resilience of the electric grid and providing an overview of the evolution of electricity markets.

One of the report's key findings was that changing circumstances are challenging electricity markets. This includes factors placing additional pressures on wholesale electricity markets, such as:

- A substantial shift in the economics of natural gas;
- An increase in variable renewable energy; and,
- Low growth in electricity demand.

Another finding was that while markets recognize and provide for reliability, they must evolve to better address resilience. While energy and capacity markets presently provide for adequate levels of reliability, recent weather events demonstrated the critical need for improved system resilience. Markets are only now beginning to recognize and compensate resilience-enhancing resource attributes, including fuel assurance.

The report also found that a combination of market and policy forces have accelerated the closure of a significant number of traditional baseload power plants and may potentially harm grid reliability and resilience. The factors mentioned earlier have all led to economic challenges for plants that traditionally operate as baseload generation. Further, in recent years, many coal plants have not been dispatched or operated on baseload, which runs counter to their original design and creates operational and economic challenges.

Ultimately, the continued closure of traditional baseload power plants calls for a comprehensive strategy for long-term reliability and resilience. States and regions are accepting increased risks that could affect the future reliability and resilience of electricity delivery for consumers in their regions. Hydropower, nuclear, coal, and natural gas power plants provide essential reliability services and fuel assurance critical to system resilience. A continued comprehensive regional and national review is needed to determine how a portfolio of domestic energy resources can be developed to ensure grid reliability and resilience.

We need only look to the recent December 2017/January 2018 Cold Weather Snap to see the impact further decreases in fuel-secure generation will have. During a January 23<sup>rd</sup> hearing early this year in

front of the Senate Energy and Natural Resources Committee, PJM President and CEO Andy Ott stated that, “we could not have served customers [during the recent cold weather] without the coal-fired resources.” During that time coal provided 40% or more of generation on certain days.

And while the Department and the Administration supports an “all of the above” energy strategy, states pursue their own energy generation policies based on a host of factors. Of course, the policy actions taken by any one state can adversely affect the price formation in the RTO/ISO markets . . . as well as national security. This is why the security of our Nation’s energy infrastructure is one of DOE’s and my office’s top priorities.

But let me take a few minutes to talk about how my office is addressing the national security of our grid. To start, the former office of Electricity Delivery and Energy Reliability has been divided into two separate offices to significantly increase the focus commensurate with the known risk on cyber and physical threats – creating the Office of Cybersecurity, Energy Security and Emergency Response (CESER) and the Office of Electricity (OE). These offices will be managed by two presidentially appointed, Senate confirmed Assistant Secretaries focused on national security initiatives.

CESER is comprised of two former Office of Electricity Delivery and Energy Reliability divisions, Infrastructure Security and Energy Restoration, ISER, and Cybersecurity for Energy Delivery Systems, CEDS. This reorganization facilitates significantly greater focus on cyber and physical threat vectors. CESER is designed to elevate coordinated preparedness and response with our partners in the private sector, as well as government at every level.

The remaining OE-predecessor divisions, Advanced Grid Research and Development and Transmission Permitting and Technical Assistance, remain in the newly renamed Office of Electricity. The reorganized OE is focused on long-term strategic and foundational R&D efforts related to the resilience and reliability of our Nation's grid necessary to ensure national security. Specifically, OE is developing and executing strategies to ensure the viability of our defense critical energy infrastructure against various threat vectors.

My office's first priority is the creation of a **North American Energy System Resiliency Model**. This model capitalizes on previous National Lab work and is being leveraged to fully understand the resiliency risks associated with operating a highly diversified regionally isolated grid that supplies electric energy for North America. Also, the model will

include analysis regarding the significant interdependencies that have evolved over the last couple decades between the various energy infrastructures. Significantly, the model will highlight where there are strategic opportunities for specific capabilities offered by certain types of infrastructure, for example . . . energy storage for frequency control.

By utilizing near real-time analysis and automated next-worse case analysis initiated by system excursions, energy system operators will be provided with situational awareness and be able to deploy a pre-determined set of mitigation strategies. This modeling effort will unequivocally be disruptive in that it will inform investments made across North American without localized state biasing which exists in each of the markets today. Most importantly, from DOE's vantage point, the model will inform national security investments that will improve our overall resiliency capability.

As we have seen in the media and as laid out in the 2018 Worldwide Threat Assessment, cyber events are increasing in frequency and sophistication. We are laser focused on **physical and cyber threats**, a top priority not only for my office but for Secretary Perry as well. Using a risk-based approach, CESER is pursuing an operational strategy for physical and cyber threats. In our role as the SSA for Cybersecurity in the Energy Sector, we have and continue to develop and execute

strategies to eliminate or reduce these risks; in some cases by taking a completely different approach . . . such as simply re-designing our cyber enabled architecture.

Taking advantage of the fact our industry's underlying infrastructure has not experienced significant change over time, we announced just a few weeks ago providing **\$25 million in funding to support energy sector cybersecurity**. The projects will fall within one of five research areas: cybersecure communications; cybersecurity for the ONG environment; redesign for cyber-resilient architecture for the ONG and Electricity Subsector Coordinating Councils; cybersecure cloud-based technologies in the operation technology environment; and innovative technologies that enhance cybersecurity in the energy sector. Selected projects will expand the development and adoption of energy technologies to enhance the resilience and reliability of the Nation's grid.

One of our Grid Modernization Initiative R&D efforts is our **Resilient Distribution Systems Lab Call Awards**. Announced last September, funding of approximately \$32 million over three years has been awarded to the Grid Modernization Laboratory Consortium and their partners to advance resilient distribution systems, focusing on advanced controls, grid architecture, integration of distributed energy resources, and emerging grid technologies at a regional scale.



And just this past Friday, I announced a **\$7.5 million funding opportunity to spur the innovative design of more flexible and adaptable large power transformers**, thereby increasing the resilience of the Nation's power grid. The research and development conducted by these projects will lead to transformers that can be shared and replaced more easily in the event of a failure as well as enhance cyber-physical security.

Another priority for OE is to **revolutionize sensing technology utilization**. The goal is to use high fidelity, reasonable cost sensing technology to integrate near real-time data into the North American Grid Model. We will also be able to use “signature” recognition and correlation modeling informed by artificial intelligence and machine to machine learning to significantly improve the performance of the grid. Furthermore, these efforts will enable strategic investments by highlighting system vulnerabilities and enhance the integration of distributed energy resources and the use of microgrids and energy storage.

**Storage**, the holy grail of energy, has a huge role to play in national security. There are various initiatives within DOE focused on storage, from pumped storage to flow batteries. Just last month, a new program

within the Department's Advanced Research Projects Agency-Energy, the Duration Addition to electricity Storage, or DAYS, announced \$30 million in funding for projects that will build innovative technologies to enable long-duration energy storage on the power grid, providing reliable electricity for 10 to approximately 100 hours. There has never been a time where the availability of megawatt scale storage has been more important. OE is pursuing storage technologies capable of providing reactive and real power control for bulk and distribution power systems as well as frequency control. Working with the National Laboratories, OE is pursuing three high probability capabilities—flow batteries using aqueous soluble organics, sodium based batteries, and rechargeable zinc-manganese dioxide batteries. The potential contributions of storage to enhance national security across North America are astounding.

Our Nation's energy infrastructure continues to grow and evolve daily, as do the challenges and threats we face. The Department will . . . and must . . . continue to exercise its national security responsibilities to maintain a resilient, reliable, and secure electric grid for all Americans. Fuel-secure generation certainly has a role to play in that endeavor and I look forward to working with you in the months and years to come on this issue. Thank you.