



CENTER FOR SECURITY POLICY

Frank J. Gaffney, Jr., President & CEO

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Chairman Neil Chatterjee
Commissioner Cheryl A. LaFleur
Commissioner Robert F. Powelson
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Comments submitted in FERC Docket RM18-1-000, Proposed Grid Reliability and Resilience Pricing

Dear Chairman Chatterjee, Commissioner LaFleur, and Commissioner Powelson:

After serving in the Reagan administration in various positions, including acting as the Assistant Secretary of Defense for International Security Policy, I founded the Center for Security Policy – a not-for-profit, non-partisan educational corporation which strives to provide timely, informed analyses and recommendations concerning critical foreign and defense policy challenges.

Among the most critical of those challenges are the various, looming threats to America's electric grid. Consequently, from the time of the Commission on the Electromagnetic Pulse (EMP) Threat's first report to Congress in 2004 to the present day, the Center – like many other leaders in the national security arena – have been warning that the grid's lack of resilience poses a potentially existential danger to our country.

As you know, this vulnerability can be exploited by enemies using a variety of techniques: **physical sabotage** (such as the incident on 16 April 2013 at PG&Es substation in California that nearly blacked out Silicon Valley and northern California for a protracted period); **cyberattack** (involving existing, in-grid capabilities and/or future ones to manipulate or even destroy control systems essential for operation of our electric grid (or, for that matter, water, communications or other critical infrastructures); or **electromagnetic pulse**, whether generated locally by portable EMP generator or radio-frequency weapon or over wide areas by the high-altitude detonation of a nuclear weapon (which North Korea has repeatedly threatened to use against us in recent weeks).

Moreover, *even if no one attacks our country*, we are overdue for an intense geomagnetic disturbance that would create damage comparable to a nuclear EMP. Indeed, the earth narrowly missed one such solar storm in July 2012, avoiding a potentially catastrophic nationwide blackout.

Finally, the recent loss of power to nearly 7.2 million Florida homes and businesses in the wake of Hurricane Irma; the blackout-induced explosions at Texas-based chemical plants in the wake of Hurricane Harvey; and the nearly complete loss of Puerto Rico's electric grid serving more

than 3.4 million people in the wake of Hurricane Maria are but the latest, and particularly acute, reminders of what can happen to non-resilient power grids as a result of destructive *terrestrial* weather. Today, weeks after Maria, the power is still out for forty percent or more of the population of Puerto Rico, an object lesson in why reliability is a necessary, but insufficient, requirement for modern grids. They must be resilient, as well.

Puerto Rico's desperate condition is a cautionary tale for what could befall the rest of the country should our enemies and/or Mother Nature take down the electric grid on the U.S. mainland you are charged with regulating. As you are well aware, our bulk power generation and distribution system is generally reliable *in the absence of severe stress*. But, it is not resilient in the sense that it has the assured capability promptly and reliably to mitigate and recover after the loss of such essential elements as: long-lead time replacements for damaged equipment, mission-critical communications, situational awareness and accessible fuel supplies.

For all these reasons, the Center for Security Policy believes it is incumbent on the electric industry to build not just reliability but *resilience* into its operations, i.e., ensuring that critical parts of the electric grid – ranging from generation, to transmission, to distribution – can mitigate, survive, and recover cost-effectively from the sorts of “high impact threats” outlined above.

You are, of course, familiar with the many methods of providing resilience in electric grid operations, ranging from protecting critical assets (through numerous techniques tailored to mitigate each of the aforementioned threat vectors) to ensuring that these assets can be restored and/or reconstituted after an outage caused by a high-impact threat.

One particularly efficacious method of bolstering resilience at electric power generation facilities is through ensuring on-site fuel storage to support system restoration (or “blackstart” capabilities) to enable electric grid operators to restore power with minimal outside assistance. National security experts agree on the criticality of such blackstart capabilities because many of the threats facing our electric grid could cause extremely widespread power outages, precipitating immense economic and societal damage.

Seized as we are with the urgency with which our nation needs to address and prevent such calamities, it was very encouraging to read the DOE staff report which Energy Secretary Rick Perry released on August 23, 2017, as well as the notice of proposed rulemaking (NOPR) which DOE issued under Section 403 of the Department of Energy Act on September 29, 2017.

It is apparent that Secretary Perry shares our assessment that we must urgently ensure the ability to achieve system restoration at electric power generation facilities as one key step in increasing electric grid resilience. Because the Secretary specified coal and nuclear power generation in his proposed rulemaking, he has received criticism by those who favor other sources of power generation, ranging from renewables to natural gas.

We suggest that the Secretary, and FERC, consider methods by which *all* businesses and organizations involved in electric power-generation, electric power transmission and electric power-distribution can be financially incentivized to build resilience into their operations. We

understand there is a concern in some quarters that subsidizing certain power-generation methods could lead to more subsidies across the industry and to an undoing of competitive markets.

Therefore, we suggest that, rather than introduce arbitrary subsidies, FERC provide a level playing-field for all parties involved by creating a “resilient capacity credit (RCC)” within every regional transmission organization (RTO) and independent system operations (ISO) market. Here is how such a concept might work: Each RTO and ISO should submit for FERC review expedited “resilient capacity” capabilities to be required within their market, in annual increments. FERC should specify the essential requirements for proposed “resilient capacity” initiatives. And electric utility providers must compete by bidding in these resilient capacity markets in order to obtain resilient capacity payments or credits.

Here are some examples of the initiatives that could qualify for such RCCs:

- A renewable power generation facility that maintains grid-scale storage (whether battery storage or pumped storage) where a certain number of RCCs could be earned for each MWhr stored);
- A “dual-fuel” natural gas power-generation facility that has a fuel oil generator with 90+ days of fuel back up oil (where the more days of back up fuel could increase the number of RCCs);
- A coal-fired power generation facility that has 90+ days of coal stored on site (where the incremental days of back-up fuel could increase the number of RCCs);
- A hydroelectric power-generation facility that has tested its analog controls to demonstrate survivability to EMP, and that anticipates gravity flow into reservoirs to meet a designated number of days of generation capacity;
- A natural gas power-generation facility in close proximity to a Liquefied Natural Gas (LNG) storage site that maintains the regasification capability to utilize the nearby LNG in case of emergencies or natural gas pipeline failures;
- A nuclear power-generation facility that has installed analog controls and tested them to survive EMP, and that seeks resilient capacity credits for periods above and beyond scheduled maintenance outage periods;
- “Coupled” power-generation facilities that enable a nuclear power plant to “couple” with a “sister” generating station (with long term on-site fuel) to provide adequate outside power to allow the nuclear plant to promptly reconstitute normal operations during a prolonged blackout (which could be made possible through coordination with NRC).

We suggest that, as part of this effort, FERC work with the Department of Energy and Department of Commerce to identify how other industries could also be incentivized to create electric power resilience within their own organizations and whether the “RCC concept” could be applied to those industries and corporations, as well.

For example, many oil refineries have “COGEN” capability, whereby they are able to cogenerate their own electricity on site. However, certain institutional and regulatory issues often result in utilities creating barriers of entry to cogenerators as well as rate structures that decrease their cost-effectiveness – leading to some refineries not taking advantage of this inherently resilient capability. Because fuel is imperative to both national defense and domestic disaster response, resilience in the form of COGEN should be incentivized in our nation’s refineries.


We also suggest that FERC take a close look at how government rulings over the past two decades have affected resilience in the system and look for ways to mitigate or reverse some of these rulings. For example, because of EPA regulations, an increasing share of interstate natural gas transmission pipeline operators (up to 10%) have changed their gas-powered compressors to electric-only compressors, making them much more susceptible to failure in the case of an electromagnetic attack (whether induced by a radio-frequency weapon or nuclear EMP) or cyberattack (due to their electronic controls and the fact that most of them are connected to the Internet.) Without new reliability standards for interstate gas pipelines that remedy this change, there will be a compelling need for back-up fuel supplies at, or directly connected to, the natural gas-fired generation plants in the nation’s bulk power system.

Another area requiring focus is on our nuclear waste. We suggest FERC collaborate with NRC to explore every method to have spent nuclear fuel rods moved from the many disparate storage facilities across the nation (mostly at nuclear power-generation facilities) to Yucca Mountain for storage and recycling. A high-impact threat or prolonged blackout that causes the failure of water pumps and cooling systems for these spent-fuel rods could turn every one of the current cooling pools into the source of local and down-wind radioactive contamination akin to Fukushima.

Given the current threat environment and our nation’s absolute dependence on electricity for its survival, we encourage both the Commission and its staff to find additional opportunities for enhancing grid resiliency, and to expedite market solutions in every area of the energy cycle through which to build incentives for electric grid resilience.

In that connection, we urge you favorably to consider Secretary Perry’s directive, including the resiliency-related goals embedded therein. We respectfully ask each of you, as Commissioners with a duty to serve the public interest, to apply the spirit of that directive to the *entire energy industry* within the capitalist structure that is the backbone of our free-market economy. Your leadership in developing and approving the incentives and market mechanisms that can assure both grid adaptability and prompt recovery when blackouts occur may make all the difference in securing our Republic, as well as its critical infrastructures.

Sincerely,

A handwritten signature in blue ink, appearing to read "Frank J. Gaffney", with a long horizontal flourish extending to the right.

Frank J. Gaffney
President and CEO

cc: Hon. Rick Perry, Secretary of Energy