

Electricity Advisory Committee

MEMORANDUM

TO: **Honorable Patricia Hoffman, Assistant Secretary for Electricity Delivery and Energy Reliability, U.S. Department of Energy**

FROM: **Electricity Advisory Committee
Richard Cowart, Chair**

DATE: **October 17, 2012**

RE: **Recommendation on Strategic Portable Generation Reserve**

The purpose of this memorandum is to convey to the U.S. Department of Energy (DOE) the Electricity Advisory Committee (EAC) recommendation that DOE not pursue a Strategic Portable Generation Reserve (“the Reserve”) and to summarize the conclusions leading to this recommendation.

DOE’s establishment of the Reserve would designate it as the national backstop power source for emergencies, with associated fuel delivery responsibility, and position DOE as an owner of critical electric infrastructure. This DOE initiative would require significant effort and provide negligible improvement to electric service reliability.

The Question: Would a DOE Strategic Generation Reserve improve reliability?

DOE’s Emergency Support Function (ESF) #12 is intended to facilitate the restoration of damaged energy systems and components when activated by the Secretary of Homeland Security for incidents requiring a coordinated Federal response. Under DOE leadership, ESF #12 is an integral part of the larger DOE responsibility of maintaining continuous and reliable energy supplies for the United States through preventive measures, restoration and recovery actions. Additional information regarding DOE’s Emergency Support Function (ESF) #12 is detailed at <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-12.pdf>.

Portable or pre-staged backup generators provide vital power under a variety of circumstances to a host of beneficiaries, from homeowners, hospitals and emergency first responders, to utility maintenance crews, nuclear power stations and Homeland Security organizations at multiple levels. Use of these generators ranges from preplanned to creatively spontaneous. Their availability can enable heroic responses to situations in which power would otherwise not be accessible. Given this, the EAC undertook to



determine whether DOE might provide a significant reliability improvement by establishing the Reserve to mitigate electric service disruptions, whether caused by natural disasters or man-made events (including cyber-attacks).

Summary of EAC Deliberations

For significant electric power interruptions, the response/restoration is usually a combined effort of electric utilities and emergency response organizations. These generally perform well together to maintain or restore order and provide essential services such as food and water, temporary shelter, and restoration of electric service. Benefits of the Reserve must be considered within the context of these collaborative efforts.

The events under consideration fall into two general categories, with the first occurring much more frequently than the second:

- Events that disrupt the distribution system on a much greater scale than the transmission grid
- Events that disrupt the transmission grid and/or power sources while leaving the distribution system essentially intact

The EAC was unable to propose any event for which the Reserve provided significant benefit. Potential events and concerns will be addressed below from a broad perspective.

For the more common circumstance of extensive damage to the distribution system with less impact to transmission, the most efficient utility approach is to undertake repair of the distribution system with all haste, giving priority to critical facilities (hospitals, police, fire, etc.) and to those circuits with the greatest load density. Restoration of the transmission system is usually effected simultaneously using a completely independent set of resources. The transmission function is typically restored well ahead of the associated distribution system, often even if temporary transmission lines or lattice steel structure replacements are necessary.

For these events, appropriately sized, onsite, portable generators serve specific loads quite effectively. Critical facilities rely on back-up power integrated into their designs for just such contingencies. Residences and businesses may use smaller, on-site generators or may opt to await grid repair, in accordance with their individual priorities.

However, using larger generators (up to 2 MW, trailer mounted diesel) from the Reserve to power distribution substations would rarely be a viable solution. The critical issue is almost always the need to get wires back in the air between the distribution substation and its loads.

Even if these Reserve units could deploy, the logistics of fuel supply within the larger area of sustained damage would not be trivial. Their burn rate would require tanker resupply at short intervals. Emergency response assistance would likely be required to ensure delivery. Similar to the utilities, emergency response teams would likely have more urgent tasks for

their available resources (e.g., evacuation of the ill and infirmed, distribution of water, fuel resupply for hospital and emergency response center fixed, backup generation).

For events that disrupt transmission and leave distribution intact, the Reserve would also be ineffective. The issue for this contingency is the number of portable generators required to supply the large population of distribution substations. It should be recognized that the critical loads have already planned for any event that isolates them from offsite power. So, DOE and/or the local responders would be left to pick winners and losers in deploying a generation fleet necessarily too small to serve all non-critical loads.

Further, within this lose/lose environment, DOE would be assuming the role of national, back-stop, emergency power source. In that role, it would bear responsibility for fuel delivery to all deployed Reserve generators and likely become an owner of critical infrastructure—with attendant requirements.

DOE would also incur the cost to warehouse and maintain the generators and initial fuel supplies between events, or take on a responsibility to determine how to stage and use them for more routine purposes between Reserve activations. Routine use would trigger permitting issues.

DOE would be funding and administering the Reserve for insignificant grid reliability improvement. In contrast, the organizations now responsible for emergency response/restoration are well positioned to continually improve their efficiencies.

EAC RECOMMENDATION:

Consistent with the deliberation summarized above the EAC recommends that DOE not pursue the establishment of a Strategic Portable Generation Reserve.



Richard Cowart
Chair, Electricity Advisory Committee