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## **Energy Traffic Control**

By JAY APT and LESTER LAVE

Pittsburgh

TWO years and one energy bill (the Energy Policy Act of 2005) after the power outage that crippled much of the Northeast, the same blackout could happen today. That's because there is still no national oversight of our complex and interlocking electrical grid.

Fortunately, a model exists for creating one: the air traffic control system. The situation facing managers of the electrical grid is not unlike the anarchy that existed in the skies before the air traffic control system was set up. Just as improvements in air traffic control have reduced the potential for human error, a similar model for electricity generation can create better tools for human operators and mitigate the impossible demands they now face.

Before our electricity system was deregulated, utilities transmitted power from nearby generation plants directly to customers. Now, California buys almost a quarter of its power from generators in states like Wyoming; Pennsylvania exports a third of its electricity; and a problem in transmission lines in Ohio can turn out the lights in New York. Wholesale competition has caused frequent gridlock on our transmission system, increasing the likelihood of a blackout. Human error is at least partly responsible for the major blackouts (affecting more than 500,000 people) that happen about three times each year.

Here's how the electrical grid could follow the air traffic control model:

- We don't let each pilot or even each airline determine flight paths without consultation and coordination with air traffic controllers. Instead, a national system has controlled air traffic for 45 years. The same logic should apply to coordinating the transmission of electricity, which is currently done by more than 100 regional control areas, each with its own procedures.
- We don't let pilots fly blind. Just as radar greatly improved the safety of flying, grid operators need much better tools like a network of sensors that tell them when and where problems are brewing and help to identify remedies like dropping some customers to save the larger grid. A national center is needed to

evaluate information from local and regional power plants and grids continually, and to relay information quickly to the local control centers.

- We don't let individual airlines set standards for training and safety. Instead, that's done by the Federal Aviation Administration. The Energy Policy Act of 2005 creates an Electric Reliability Organization with the authority to set and enforce standards for reliability. But it depends on industry self-audits. This is a recipe for failure. The new organization can't be truly effective unless it can mandate standardized training and certification, specify data and controls, and conduct inspections and tests.
- We don't rely on airlines to investigate their own mistakes. The National Transportation Safety Board, an independent agency, does a stellar job of investigating crashes and "near misses" to determine steps and precautions that will prevent them from happening again. For the new Electrical Reliability Organization to be effective, it will have to be able to do the same for the transmission grid.

We don't hear about blackouts as often as we hear about airplane emergency landings or crashes, but they occur a few times each year, with costly consequences. A deregulated power industry is not in a position to bring about the continent-wide reforms, coordination and cooperation needed to make our power grid more reliable and responsive to emergency situations. Let's hope it doesn't take another system crash to bring rational administration to electricity transmission.

*Jay Apt is executive director, and Lester Lave is co-director, of the Electricity Industry Center at Carnegie Mellon University.*