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August 14th Blackout

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What Happened?

At approximately 4:00 pm EDT on Thursday, August 14, 2003, a series of events began that resulted in the largest system failure of the interconnected Eastern North America grid in history. Approximately 50 million consumers were subject to a cascading blackout in as little as ten minutes. The approximate amounts of disconnected load, by region, were as follows:

- Mid-West (MISO): 18,500 MW (peak load of about 120,000 MW)
- Ontario (IMO): 20,000 MW (peak load of about 24,000 MW)
- New York (NYISO): 24,500 MW (peak load of about 29,000 MW)
- Mid-Atlantic (PJM): 4,000 MW (peak load of about 55,000 MW)
- New England (ISPO-NE): 2,500 MW (peak load of about 25,000 MW)

While some areas had power quickly restored, much of the New York, Mid-West, and Ontario regions were without power for over 24 hours and experienced limited service for two to three days.

What Caused It?

At this time it appears that the initial events occurred in a section of the Eastern interconnection near Lake Erie that traditionally experiences "loopflow" problems. For unexplained reasons, the initial events were not contained by system protection devices and a series of subsequent outages at generation plants and failures of linked transmission lines caused the cascading blackout throughout the United States and Canada.

The United States Department of Energy has announced that it will investigate the reasons for the blackout in coordination with Canadian agencies. There are likely to be numerous other investigations, including one by the North American Electric Reliability Council (NERC), which has responsibility for establishing electric reliability guidelines and rules.

What Needs to be Fixed?

Even before the cause has been determined, there have been numerous pronouncements that the only way to prevent future region-wide blackouts is to invest many billions of dollars in new transmission lines and infrastructure. While some enhancements to the existing grid will undoubtedly be warranted, a decision to make large-scale changes to the existing system may be premature. Consider the following:

- The New England and Mid-Atlantic regions were relatively unaffected because their protection systems worked and successfully isolated these two regions from the problem areas in the Eastern interconnection;

- The Connecticut and Vermont areas that were affected by the blackout have already been identified as "weak" areas and proposed transmission enhancements to strengthen these areas are proceeding through the regional approval process;
- Enhancements to the transmission "superhighway" may be less effective than strengthening the distribution "secondary roads" and adding distributed generation facilities to improve reliability through greater redundancy;
- Improving the energy efficiency of existing loads, as well as improved energy management and demand response programs, will increase overall system reliability for less cost and less disruption than building and siting new transmission lines;
- Technological enhancements to existing transmission facilities, rather than constructing new transmission facilities, may provide adequate protection from cascading events at a fraction of the cost of the new facilities; and
- Coordinating system planning on a regional basis by an independent system operator or some similar entity.

In hindsight, the events of August 14th may be found to have been more of a random occurrence than evidence of an inadequate transmission system. Improvements can certainly be made to lessen the likelihood of such events impacting such a large region in the future. Nonetheless, occasional unplanned losses of load, contained to small geographic areas, are perhaps unavoidable. Natural events, human error, and system failures cannot be completely engineered out of a system as complex and interdependent as the electric grid. The goal should be to find an appropriate balance between a standard for reliable electric service and the cost to achieve that standard.