ELECTRIC RELIABILITY: How Much, By What Means, At What Cost?

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At the 24th Annual North American Conference of the USAEE/IAEE:
Energy, Environment and Economics in a New Era
Economic Costs of Outage

• Much of the current national energy policy debate centers around building new transmission lines

• The actual debate should center on electric reliability: how much? for whom? by what means? and at what cost?
Economic Costs of Outage

• The proper measure of economic cost of an outage is the VOLL: Value of Lost Load
• VOLL is almost always higher than electricity rates
• Historically, we established Loss of Load Probability (LOLP) criteria in order to avoid outages. Reserve margins were typically set for one day of generation-related outages per ten years. Is this optimal?
• This did not capture transmission and distribution-related outages
Economic Costs of Outage

• The most recent attempt to deal with outage costs is a September 2003 LBL Report: “Characteristics and Trends in a National Study of Consumer Outage Costs.”

• An effort at creating a meta-data set of value of reliability studies over the last 20 years.
Economic Costs of Outage

• That study found that the “average” cost experienced by the “average” customer for a one-hour summer afternoon outage is approximately:
  – $2.90 for residential customers
  – $1200 for small commercial & industrial customers
  – $8200 for large commercial and industrial customers
Economic Costs of Outage

- Outage costs increase substantially, not linearly as outage duration increase from one hour to eight hours.
- Outage costs are generally higher in the winter.
- There is no average cost; there is no average customer. We need to look at the marginal costs of individual or subgroups of customers.
Economic Costs of Outage

• There are significant and key differences in outage costs across different regions (and climate), time of day, consumption, and different business types.

• Because of these differences, the aggregated averages do not provide policy-makers with useful information on what steps should be taken.
Economic Costs of Outage

• Value of Service Studies should be done subregionally

• The uniqueness of a given locality is not a problem of collinearity of variables; the uniqueness of a given locality in most cases helps to identify the level of reliability reasonably achievable in a given geographic location

• Because of uniqueness, the average on average is wrong.
Federal Regulatory Response

• The Federal Energy Regulatory Commission has responded by providing an incentive rate of return for new transmission investment.
• Additional suggestions in the FERC White Paper that were not implemented – because they are beyond FERC’s jurisdiction and authority.
• Vegetation Management Policy?
• Reliability Task Force.
• Seeking Authority to Enforce NERC Reliability Standards
State Regulatory Response

• Most states have had reporting and monitoring requirements
• Increasingly state commissions are requiring the use of performance indices to measure reliability, sometimes with penalties for failures to meet the standards.
State Regulatory Response

• Dispatchable demand-side management response to be compensated in some states, such as California, and New York, where there are organized wholesale markets

• Effectively a strike price set at the value of service / value of loss load
Meat Ax Approach and Unintended Consequences

• It has been suggested that transmission planning be done on a regional basis by the RTO
• Might not capture the granular richness at the subregional / individual customer level
• Locational Marginal Pricing combined with financial Congestion Management Rights could create unintended consequences: Argentina and perhaps in the United States

• Follow the data where it leads you – sometimes to distributed generation, sometimes to transmission enhancements or new lines, sometimes to dispatchable demand-side management

• Otherwise, economic waste