

Reliability and the Energy Policy Act of 2005



# Reliability and the Energy Policy Act of 2005

*The Energy Policy Act of 2005 recently signed into law by President Bush contains a long list of provisions for everything from hybrid vehicles to new coal technologies. For the electric power industry, most of the legislation's measures can be viewed as supporting one overriding objective: grid reliability. For residential electricity consumers, reliability typically means "no outages." For large industrial users, it extends to brownouts and power quality issues, but essentially amounts to the same idea: the absence of problems.*

For the organizations charged with operating the nation's power grid, the concept of reliability is more complex and encompasses a broad range of things, some of which are addressed in the Energy Policy Act.

The most relevant portion of the Act's electricity title for reliability issues involves the creation of mandatory reliability standards for utilities and other transmission owners. The Act directs the Federal Energy Regulatory Commission (FERC) to establish an Energy Reliability Organization (ERO) and a set of reliability rules that this new ERO will enforce with penalties for non-compliance. This structure replaces the voluntary regime currently overseen by NERC.

Knowing what the standards are and who is responsible for meeting them is key to maintaining grid reliability, but where does reliability "happen?" What can utilities do to avoid major power outages?

## **New and Established Technologies**

Many would point to new and established technologies that help to stabilize transmission pathways, allow more power to flow on existing lines and alert operators to potential problems before they grow into widespread disturbances. These include the following:

- Real-Time Wide Area Monitoring and Control Systems provide grid-wide monitoring and control of power flows, transmission limit calculations, and power plant operation. Grid operators can use WAMS to see beyond their control area and take steps to mitigate disturbances before they grow into major outages.
- High Voltage Direct Current (HVDC) transmission systems allow power flow across regions without troublesome "loop flows" while providing support and performance enhancement for the surrounding AC Grid. HVDC links also can be loaded fully without the risk of cascaded line tripping.

- HVDC Light offers enhanced voltage control and black start capability in addition to all the advantages of HVDC.
- Flexible AC Transmission Systems (FACTS) such as Static VAR Compensators (SVC) and Series Capacitors, enable more power to flow on existing power lines, improve voltage stability and make the system more resilient to “system swings” and disturbances.
- Gas Insulated Sub-stations (GIS) and Underground Cables enhance reliability, especially in urban networks, using a minimum of space.

*The August 2003 blackout...was exacerbated by the inability of operators to see beyond their own control area....*

All of these technologies contribute to grid reliability, but they each have their own applications and they all come at a price. Utilities must weigh decisions about investing in these measures against other priorities. This is important because it represents the crux of the issue for grid operators: how do you maximize reliability while also satisfying other business objectives, given limited resources?

The fact is, reliability really “happens” in the day-to-day activities of grid operator organizations. These include decisions about everything from how heavily to load a given transformer during the afternoon peak to whether or not to defer maintenance on a given switchgear assembly, or evaluating alternatives to replacing a given piece of equipment. These everyday concerns are just as vital to ongoing grid reliability as the deployment of advanced technologies. The August 2003 blackout, for example, was exacerbated by the inability of operators to see beyond their own control area, but the event began because a line sagged into a tree. Advanced monitoring and control systems would have mitigated the problem once it began, but better vegetation management would have prevented it from starting.

## **Spending Alternatives**

The challenge for transmission owners lies in choosing between a wide range of spending alternatives (refurbishment, replacement, operating procedures, training, etc.) Each offers its own direct impact on reliability, but also interacts with other activities to produce secondary effects. Understanding the myriad relationships between choices requires the ability to consider alternatives on the basis of a common set of objectives.

The process of evaluating various options with an eye towards optimizing business goals is the essence of what is known as “asset management.” This is a “bang-for-the-buck” approach that takes into account all of the costs and benefits of a given option in determining a course of action that is best suited to achieve the organization’s objectives. Asset management considers things like maintenance practices, operating procedures, and replacement costs together, and also takes into account how various options interact. The result is a plan for deploying capital and other resources that, in total, delivers the greatest benefit toward achieving the transmission owner’s stated objectives.

The Energy Policy Act of 2005 includes a number of measures that support grid reliability in various ways. Increased siting authority will allow FERC to shorten the permitting process for new transmission projects. Incentive-based rates will encourage further investment in transmission. Incentives for deploying advanced technologies like those listed above will expedite their increasing implementation. And of course the mandatory reliability standards will set the regulatory foundation upon which all of these other activities can be built.

When it comes to actually spending money, however, most utilities will remain focused on managing their existing systems, and for that a comprehensive asset management plan is the key to success. Transmission owners will receive compensation for costs incurred in compliance with the new standards, but the ability to optimize expenditures (and other resources) against a set of business objectives—including reliability—will be increasingly vital.

For more information on this position paper please call your local ABB representative or: Gary Rackliffe, VP Strategic Operations, at (919) 807-5054 or by e-mail at [gary.rackliffe@us.abb.com](mailto:gary.rackliffe@us.abb.com).



ABB Inc.  
Corporate Communications  
501 Merritt 7  
Norwalk, Connecticut 06856  
Tel. (203) 750-2200  
Fax (203) 750-7788

[www.abb.us](http://www.abb.us)

Copyright © 2005 ABB Inc.

3BUS060013R0001 081205V1PT