the Lights

Maintaining reliable grids in a deregulated power industry will get harder, as temptations to cut corners multiply

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OF ALL THE ENERGY conversion processes in existence, the U.S. electric power system is the largest and most complex. Unlike such industries as communications and transportation, where a demand in excess of supply produces a "busy signal" or temporary grid lock, the nature of the electric power system is one of instantaneously matching supply and demand. Failure to sustain this balancing act can result in partial or complete breakdown of the grid system. Even just a disruption in supply or a merely inadequate voltage can cause key industries like oil refining and high-technology manufacturing to suffer expensive shutdowns and lengthy production line recovery times.

With deregulation introducing market principles into the power industry, concern over the reliability of the electricity supply has magnified. This is because the emphasis seems to be shifting from reliability as the mainstay of the nation's essential power base to reliability as a commodity in the power market.

At the root of all the changes is the industry's movement from simple "wheeling" (trading power) between utilities to wholesale and retail competition among utilities and distributors, a move that was initiated in part by the 1992 Energy Policy Act and Order 888, issued by the Federal Energy Regulatory Commission (FERC), Washington, D.C., in 1996. Now, nonutility generators not only have the right to sell into the market, but also are afforded open and equal access to the transmission grid—all to foster competition, increase efficiency, and lower energy costs. Consequently, issues of reliability and security have come under pressure from financial interests, and utilities' previous "obligation to serve" has been supplanted by entrepreneurial vigor _see "What is power system reliability?," p. 37.

Since the issuance of the commission's Order 888, the paramount concerns within the industry have been that:

- Market economics would define the optimal cost/benefit tradeoff that determines how system reliability is maintained and provided
- Voluntary cooperation between utilities and integrated planning would disappear.
- Voluntary compliance with reliability issues would be lacking to the detriment of the global network.
- Open access would lead to multiple transactions, system overloads, and operational difficulties.

The current and near future

In the face of these concerns, the U.S. electric power industry has performed a mammoth task in moving forward in its restructuring efforts while keeping the lights on. It is true that a high degree of chaos still exists, but it must be remembered that, despite the high level of cooperation that has existed in the past, the U.S. industry is greatly fractured. Today's electric utilities exist in many forms—investor-owned, state-owned, federally owned, and municipals. What's more, each state has its own Public Utility Commission, and interconnections cross utility and state boundaries.

To review progress in North America, it is often helpful to look overseas to see how the global move to privatization and restructuring is functioning there. But the comparisons for electric power are often futile. Much progress has been made, for example, in nations whose countrywide systems consist of a single entity. A case in point is the United Kingdom, where privatizing the sys-

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