

NERC Forecast: 22 Necessary Actions Required To Save U.S. Electric Grid

by Marsha Freeman

Every Fall, the North American Electric Reliability Council (NERC) issues a forecast of the adequacy of the electric grid to deliver reliable power throughout the United States, Mexico, and Canada over the following decade. NERC's "2006 Long-Term Reliability Assessment," released on Oct. 16, confirms the recent warning by *EIR*, that without massive investment in electric generation and transmission infrastructure, manpower, and new technology, reliable electric power will become a thing of the past.*

For the past decade, NERC has warned that the replacement of a regulated electric industry, in which participants cooperate and conform to standards to ensure the reliability of the system as a whole, with the restructuring of the industry into competing entities with near-total disregard for the integrity of the complex grid system, would threaten reliability. That day has now arrived.

Electric utilities forecast that demand will increase by 19%, or 141,000 MW, over the next ten years, the report states. But the resources that have been committed to meet that demand, increase by only 6%, or 57,000 MW, over the decade. The result is that capacity margins, needed to be available to meet unexpected extreme weather, unscheduled maintenance of plants, and other contingencies, will fall below minimal target levels of 15% in most of the United States within the next 2-3 years. In New England, for example, the report states that installed capacity for reserve margins will fall to "almost 0 percent in 2015" if policies are not changed.

It should be noted that the projected 19% increase in electricity demand over the next decade bears no resemblance to the rate of increase that would be needed, should industrial production, such as idled auto and machine-tool factories, reopen for business, and new energy, transport, health, water, and other infrastructure be built. During the heyday of the U.S. space program in the 1960s, for example, the Apollo-driven economic growth decade, electricity demand grew by 7% per year.

The NERC report puts forward 22 "necessary actions" that must be taken to prevent this downward spiral in reliability and to avoid shortages. These include the addition of power-generation facilities, new and upgraded transmission

lines, arrangements to provide for the reliable supply and delivery of fuel, and addressing the issue of the aging of the workforce in the electric industry. The alternative is an increasing frequency of brownouts and blackouts.

Thank You, Deregulation

Forecasting electricity growth a decade in advance, in order to project what resources are necessary, is, at best, inexact. But deregulation has made this nearly impossible, by fostering what NERC describes as a "short-term resource acquisition strategy," which has become "the norm over the past ten years." The organizing principle of bottom-line profits has created a situation where the construction of large-scale baseload power plants is not often seriously considered. No longer do state regulatory bodies work with utilities to plan long-term investments to meet projected need.

But NERC warns that simply planning to increase the construction of new power-generating plants will not solve the problem. In some cases, more plants can make the problem worse, creating more congestion on over-stretched transmission lines.

While peak demand for power is projected to increase by 19% over the next ten years, total transmission miles are projected to increase by less than 7% over the same period, or 9,000 miles of new transmission to be added to the grid through 2010, and a total of about 12,873 miles by 2015.

"Without expanded transmission system investment," NERC states, "grid congestion will increase." In some situations, "this can lead to supply shortages and involuntary customer interruptions." Under deregulation, "the present transmission planning horizon is five years or less," the report states, which leaves entire sections of the country without adequate long-term transmission capacity.

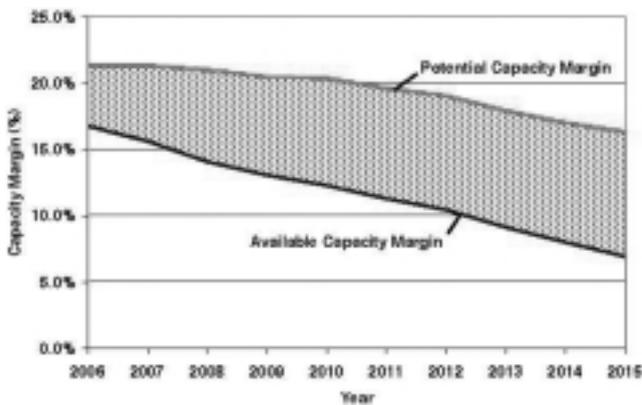
The recent skyrocketing cost of housing, NERC notes, has been accompanied by an increase in land prices. Land inflation, combined with delays due to court challenges by environmental groups, has stymied developers from planning and building new transmission capacity.

NERC notes that the adequacy of electricity supply depends not only on the installed capacity of generators, but on an adequate fuel supply and delivery system. For the past two years, for example, long-delayed track maintenance and upgrades on rail lines have curtailed coal deliveries from the

* "The U.S. Electric Grid Is Reaching the End Game," by Marsha Freeman, *EIR*, Sept. 22, 2006.

FIGURE 1

Capacity Margins in the U.S. Will Decline



Source: 2006 Long-Term Reliability Assessment report from NERC. October 2006.

Throughout much of the nation, electricity capacity margins will decline, and some will reach unacceptable levels as early as 2008. “Potential capacity margin” denotes new generating capacity that NERC hopes will materialize, but is “uncommitted.” These resources do not have transmission service reserved, or have other important constraints, making it unlikely they will be able to relieve the coming decline in supplies.

Powder River Basin to electric generating plants.

Natural gas-fired generating capacity additions are projected to account for almost half of the resource additions over the next decade. Gas became the fuel of choice when new nuclear power construction was sabotaged, and because it was cheaper than petroleum and cleaner than coal. But electric utility gas contracts can be, and have been, curtailed during cold Winters, in favor of residential heating needs, causing electricity supply problems. And the tripling of natural gas prices, in lock-step with rising oil prices, over the past three years, is driving up the cost of electricity to consumers.

As compared to the two nuclear power plants that were undamaged by hurricanes in the Gulf of Mexico last year, natural gas supplies from offshore wells were curtailed for months. Hydroelectric power in the West is subject to drought, and failing inland waterway infrastructure has adversely affected barge-delivered coal.

The NERC report points out that the current craze to turn to the use of liquefied natural gas (LNG), will make the United States vulnerable to the same price fluctuations and supply interruptions as occur with petroleum, since LNG will come largely from the same regions of the world from which the U.S. imports oil. NERC describes LNG as “increasingly unreliable as a utility fuel in the years ahead.”

‘Renewable’ Resources Hoax

Another craze with the potential to destabilize the fragile electric grid is the promotion of “renewable” energy sources. Currently, a total of 21 states and the District of Columbia

TABLE 1

Aggregate Capacity Under Development by Type

Capacity Type	Capacity Additions, MW			
	1998 to 2005	2006 to 2012	2013 to 2015	2006 to 2015
United States				
Combined Cycle	143,694	34,074	-	34,074
Simple Cycle	75,314	3,890	-	3,890
Coal	2,168	29,404	3,885	33,289
Nuclear	2,567	2,366	2,550	4,916
Wind	5,705	8,769	-	8,769
Other	1,572	3,170	-	3,170
Total U.S.	231,019	81,672	6,435	88,107

Source: 2006 Long-Term Reliability Assessment report from NERC. October 2006.

have adopted requirements for the purchase of renewable energy by utilities, sometimes for as much as 25% of their total supply. Wind generation is expected to provide the bulk of this “renewable” energy.

However, NERC points out, “wind generation is often located in remote areas, which requires new transmission construction to deliver its energy” to where it is needed. In addition, because wind and other “renewable” resources are intermittent in nature, generating capacity is unpredictable, requiring the installation of additional reliable generating capacity, usually fossil-fueled, to ensure the ability to serve customers.

As seen in **Table I**, during the seven years between 1998-2005, more than 231,000 MW of electric generating capacity was added to the U.S. electric grid. NERC’s projection for 2006-2012, at 81,672 MW, is substantially less than half that amount. Even the projected addition of natural gas-fired units, in combined or simple cycle systems, is dramatically reduced, with companies making few long-range plans for capacity additions.

Studies have found, NERC reports, that the loss of skilled and experienced talent in the electric utility industry will be more acute than in the economy as a whole, as Baby Boomers retire over the next few years. Currently, college electrical engineering programs are graduating only about 500 engineers per year, as compared to nearly 2,000 in the 1980s. The United States is facing the challenge of the aging of the workforce, as well as the infrastructure, of the electric utility sector of the economy.

Any effort to reopen shuttered factories; to retool auto and machine-tool plants; to recreate a nuclear industry; and rebuild transport, health, water, and other infrastructure, using the most advanced technologies, will be challenged by a shortage of deliverable, reliable electric power.

This is where the rebuilding of the economy must begin.