

EIR Science & Technology

'Clean Air' could finish off the electric utilities

Amendments to the Clean Air Act proposed by President Bush on June 5 could be the death knell of the already-stressed electric utility industry. Marsha Freeman reports.

Last summer many Americans experienced something for the first time—power shortages, appeals from utilities to conserve, and brownouts. Depending upon the weather this summer, and where you live, the severity of electricity disruptions will vary. What is clear, however, is the fact that whole regions of the nation have entered a period of inadequate electric power reserves, as a result of the combined decapitalization of the utility industry, and demand growth higher than forecast.

Reason would dictate that government officials reconsider the disincentives that make investment in new generating capacity prohibitive, and develop a plan to put the utilities back on the road to economic health. Instead, on June 5 President George Bush announced a series of measures being presented to Congress as amendments to the Clean Air Act. They can only make the problems worse.

Since 1977, when amendments to the act forced electric utilities to start “investing” (read: wasting) \$10 billion per year to bring coal-burning power plants into compliance with the regulations regarding the emissions of sulfur dioxide and nitrogen oxides, this tax burden has been born by utilities, and passed on to their customers.

At that time, a significant section of the steel industry which also burns coal, was not in a financial position to sustain such a tax. Many older steel mills in Ohio, for example, simply shut down. Today the electric utilities are faced with a cumulative financial warfare which has degraded the value of their bonds, prevented them from raising new capital, and forced them to pay usurious interest rates on the debt they hold.

This was brought about by Wall Street's double-digit

interest rates; targeted attacks on nuclear power plants by “environmentalists” who delayed their completion and operation, sometimes by decades; and rulings by state public service commissions, sometimes in collusion with the anti-nuclear lobby, to prevent utility companies from recouping the investments they had already made in new baseload generating capacity. **Figure 1** is a graphic picture of what has happened to the industry.

In the last 15 years, investors have lost \$12 billion from the dilution of utility stock book values due to the anti-nuclear attacks on their plants. At present, many utilities are trying to “restructure” to save money. Potomac Power in Washington, D.C. is laying off 10% of its workforce, and the Tennessee Valley Authority is eliminating 4,000 full-time employees to save \$143 million.

This nation is reaching the limit of how many body blows the electrical industry can sustain. Already, the resurgence in demand growth, in some areas as much as five times the 2% per year that has been forecast for the next decade, is straining the resources of New England, the Mid-Atlantic, and other parts of the country.

If, on top of the problems they already have, utility companies are forced to shut down coal-burning capacity where it does not make sense economically to bring into compliance with the new regulations, we will face disruptions on an accelerated timetable.

The EPA hit list

The day after the President released his proposals, the Environmental Protection Agency made available its hit list of 107 coal-burning electric generating plants which bureau-

crats expect will be out of compliance with the new regulations. The new standards set an upper limit of 2.5 pounds per million British thermal units of energy produced for sulfur dioxide emissions. It has been assumed by the administration that these emissions are the cause of acid rain.

The goal of the proposals is to reduce the amount of sulfur dioxide emissions by half, or by 10 million tons per year, in a two-phase program, by the year 2000. The EPA disregards the fact that there is no rigorous scientific evidence to prove that sulfur emissions cause acid rain, that ground-level ozone causes cancer, or any of the other assertions made in the EPA rationale for the new regulations.

The President and the EPA refused to even wait until the results of the 11-agency National Acid Precipitation Assessment Program report is done in 1990. This study was mandated by Congress in 1980 precisely because there was no scientific consensus on these environmental questions. Congress should consider what the point is in even completing the study, if these drastic actions are going to be taken now anyway.

The hit list itself is probably optimistically short, since it assumes it will be possible for utilities to purchase coal "based on economics, with sulfur content lower than allowable levels," and it only includes units in excess of 100 megawatts (MW) of capacity.

The EPA asserts that utilities will stop burning high-sulfur coal, which is mined in West Virginia and the midwest, and will switch to low-sulfur western coal. It is unlikely, however, that the legislation will make it through the Congress with this "fuel switching" provision, because, as West Virginia Senator Robert Byrd (D) already stated, it would devastate the mining industry and economy of his state, among others.

George Applegren, the administrative manager of the Mid-America Interconnected Network headquartered in Illinois, reports that this "fuel switching" will face another problem, with which his region has experience. Utility boilers are designed to burn certain types of coal. If the characteristics of the coal change, the plant runs the risk of higher numbers of forced outages for maintenance.

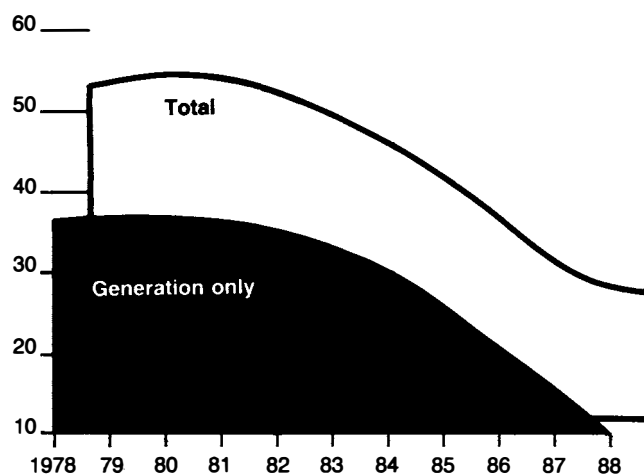
Even taking the list at face value, it is clear that it could be the straw that breaks the camel's back of reliable electric power, because even without any new environmental restrictions, U.S. utilities are reaching the end of reliable electric power.

Reliability is disappearing

The capacity margins in electric generation do not represent "excess" power, where the connotation is that these plants are somehow "extra" and unnecessary.

The reason it is necessary to have "extra" capacity in this industry, is that electricity cannot be stored or stockpiled, and you cannot promise a customer you will deliver it "tomorrow." It has to be constantly produced, in an amount

FIGURE 1
The collapse in utility capital investment
(in billions of \$)



Source: *Nuclear Industry* magazine, November/December 1988.

Between 1982 and 1987, utility industry investment dropped from \$40.2 billion to \$26.6 billion. The drop in generation equipment investment was even more dramatic.

which satisfies the demand at all moments. Therefore, there must be plants that can be called into service if maintenance outages occur that were unexpected, or just to ease up the load for scheduled maintenance.

Conditions such as drought, which can reduce hydroelectric energy supply and cooling water for thermal plants, cannot necessarily be readily predicted. An unpredicted heat wave can drive demand up dramatically in a matter of days. About 30% of peak demand is determined by the weather. Reliable power means being prepared for the "unusual."

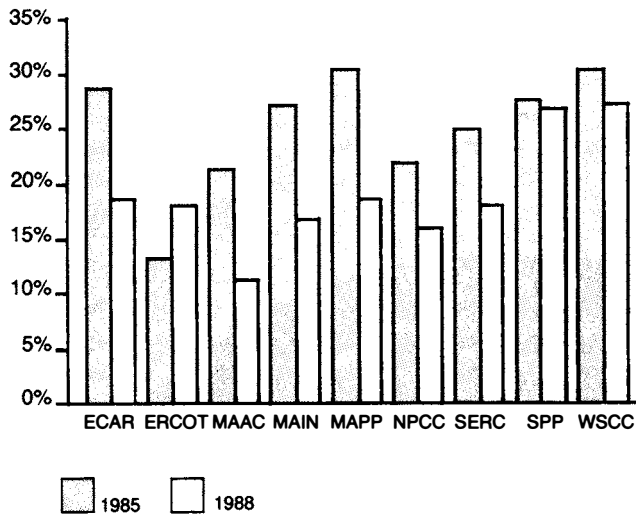
Capacity margins are determined by subtracting the peak demand from the total capacity in a system, divided by the peak demand, and are therefore, expressed as a percentage of what is available over peak demand.

Figure 2 presents the change in utility capacity margins in 1985 versus last year. Only in Texas, or the ERCOT reliability region, did capacity margins increase. Though about 20% capacity has historically been considered a safe margin for electricity generation, it is clear that by 1988 out of the nine reliability systems, only two were at or above that margin.

Capacity margins have been falling dramatically both because demand has been increasing faster than predicted, and because the addition of new capacity has slowed down to a trickle.

Figure 3, also from the Arthur Andersen study, "Electric Power Trends," published this year, is alarming. In the 12-

FIGURE 2
Capacity margins by region, 1985 vs. 1988



Source: Arthur Andersen & Co./Cambridge Energy Research Associates.

For the past three years, reliability has been falling in all but one region of the country.

year period from 1976 to 1988, the Northeast Power Coordinating Council, which includes all of New England and New York, experienced a 0.8% growth in generating capacity. For the nation, the compound growth rate was 4% per year, but it is plain to see that a large percentage of that new capacity was in the West and the Southeast regions.

At the same time, the growth trend in sales of electricity has surprised the no-growth forecasters. In 1987 and 1988, national electricity sales grew at rates of 4.5% and 5.1% respectively. This growth was much higher than the predicted 2%, and in most regions it was not purely a result of unusually hot summers. The Mid-Atlantic region, for example, has hit new record summer peaks in demand for each of the past six years.

During the economic growth period of the 1960s and early 1970s, electricity demand grew at an average of 8% per year, as seen in Figure 4. The 1974 oil embargo, resulting in a quadrupling of energy prices and overall economic slowdown, led to a 2.8% average growth, through the early 1980s, after a first-time drop in electricity consumption in 1982.

The rebound of electric demand growth for the past few years, however, has not been fueled by booming industrial production. In 1986, according to the Arthur Andersen study, the residential sector replaced the industrial sector as the largest purchaser of electric power. The "energy intensity" of the U.S. economy has been declining precipitously since the early 1970s, as seen in Figure 5.

Increasing residential demand is due to the fact that a large majority of the new houses being built are electrically heated as well as cooled, not that the poor are living better. The collapse in energy consumption per unit of gross national product is simply a function of the fact that this meaningless economic measure includes largely stock market, real estate, and drug money transfers, which hardly take any energy!

What the future will hold in terms of the rate of growth in demand is unknown. If there were to be an economic upsurge in manufacturing industries, and return to the traditional 6-8% per year rate of electricity demand growth, the country would face an immediate crisis.

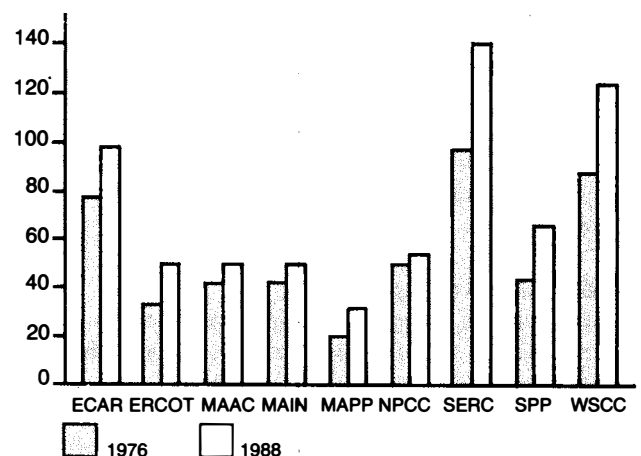
Even without such an Apollo-style mobilization to restore the nation to economic growth, the paltry 3-5% growth rates of recent experience will push many regional power systems over the edge.

The Midwest in trouble

There are regions in the U.S. which are, or may soon be, in trouble due to the environmentalist attack and the overall aversive environment. And then there is the New York/New England region, which has brought its problems upon itself.

The region that will suffer most dramatically if the new Clean Air Act amendments are enacted into law is the industrial heartland of the formerly industrialized United States. The ECAR (East Central Area Reliability) region includes parts or all of Ohio, Indiana, Pennsylvania, Kentucky, and Michigan. Coal produces 85% of the electric power in the region, and out of the 107 plants on the EPA hit list, 40 are in this part of the Midwest.

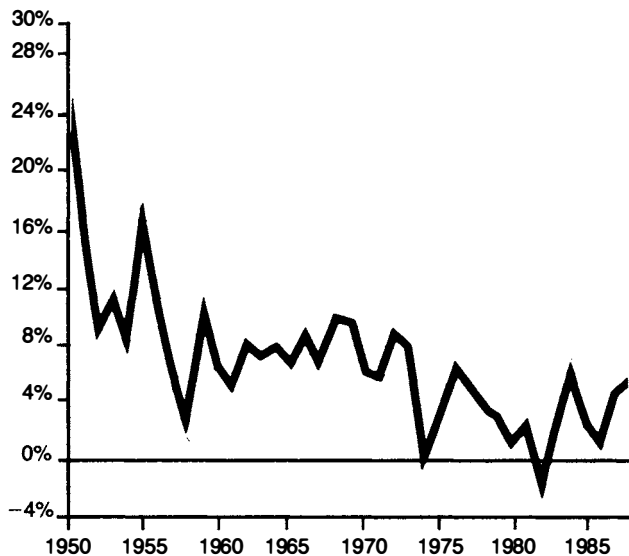
FIGURE 3
Installed generating capacity, 1976 vs. 1988
(Thousand megawatts)



Source: Arthur Andersen & Co./Cambridge Energy Research Associates.

FIGURE 4

Growth rate in total electricity sales



Source: Arthur Andersen & Co./Cambridge Energy Research Associates.

During the summer of 1988, ECAR's peak demand was 10.3% over the previous peak, and 10.5% higher than was forecast. The management of ECAR stated before Bush's announcement that the region's reliability "would be inadequate if any one of the recent legislative proposals [regarding acid rain] is enacted."

One reason is that more than 137 coal-burning plants in the region, or 24% of total capacity, are more than 30 years old. It is questionable whether a utility could economically justify spending millions of dollars to add more pollution control equipment to these units, considering their remaining operational life.

According to Thomas Hand, executive director of ECAR, the equivalent of at least 10,000 MW of electric capacity would be lost and would have to be replaced, if the amendments go through. That is 10% of the total capacity ECAR plans to have operational at the end of this century, and none of this 10,000 MW has been planned to be built. Currently, ECAR is planning to add only about 3,000 MW between now and the year 1998, and that is needed just to maintain reliability and meet future demand.

Hand pointed out that when scrubbers are added to a power plant, 5-6% of the plant's capacity is used to run the scrubbers. That lost capacity then has to be replaced. There will be a premature retirement of older units to avoid scrubber costs. Since plants with scrubbers are not as reliable as ones without because they more frequently suffer forced outages, about 1,500 MW of new capacity will be needed just to "go

back to the equivalent reliability" the region had before the new regulations.

In addition to these effects from the acid rain legislation, Hand pointed out that at some older plants, *it may not be possible* to meet the proposed nitrogen oxide standards.

Hand stated categorically that 10,000 MW of additional capacity *could not be built* in the next 10 years. What would be sacrificed is reliability.

But this attack will not only affect ECAR. Initially for the sake of economy, and more recently out of necessity, the ECAR region has been sending power long distance over transmission lines, or wheeling power, to utilities further east which burn expensive imported oil, and are short of power. These include the utilities which are part of PJM, or the Pennsylvania/New Jersey/Maryland inter-tie, and also Virginia Power Company.

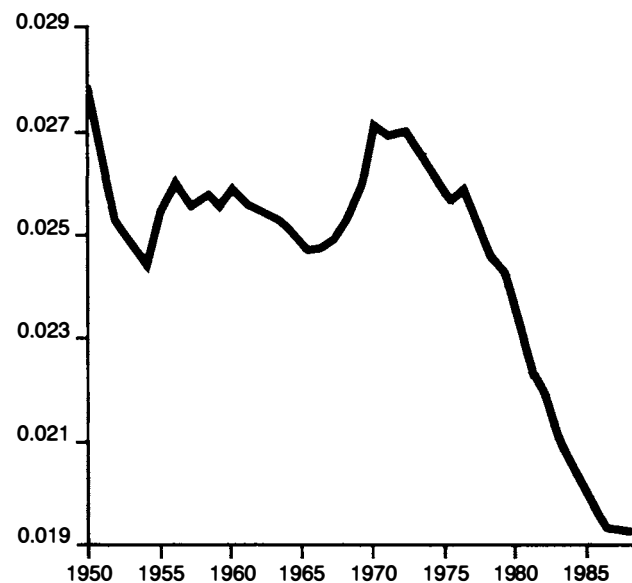
If ECAR itself is scrambling to try to meet its own demand, because capacity is being shut down and degraded due to acid rain regulations, that power wheeling will fall by the wayside.

Shooting yourself in the foot

Possible forthcoming environmental regulations will be only the most recent attack on the utility industry. Over the past few years there have been a number of unfortunate examples of gross stupidity, and capitulation to anti-nuclear, anti-industry organizing, which has nearly destroyed the concept of reliable power in a number of parts of the country.

FIGURE 5

U.S. energy consumption/GNP ratio



Source: Arthur Andersen & Co./Cambridge Energy Research Associates.

The two by-now infamous cases are the Seabrook, New Hampshire and Shoreham New York nuclear power plants, which are complete, but have not been brought into operation due to anti-nuclear propagandistic sabotage, in collusion with public regulators, and intransigent government officials.

Happily, in the case of the Seabrook plant in New Hampshire, the Reagan administration announced last winter that the Federal Emergency Management Agency (FEMA) would be responsible for emergency evacuation plans, and that Massachusetts Gov. Michael Dukakis and his stalling were now out of the picture. The plant has received its low-power testing license, has loaded fuel, and was expected to go critical last week.

Seabrook could be at full power by early July, which would make it available for the worst of the summer peak demand. The effect on reserve capacity margins that one plant can have on a region is seen in **Figure 6**. Hopefully, this will avoid the events of last summer, when power outages due to increased demand led to a loss of \$87 million of business, in the state of Massachusetts alone.

Not so with the Shoreham nuclear plant on Long Island in New York. There, after years of frontal assault by the anti-nukes, Gov. Mario Cuomo, and a Public Utilities Commission led by publicly anti-nuclear former federal official Peter Bradford, the management of the Long Island Lighting Company caved in to the pressure.

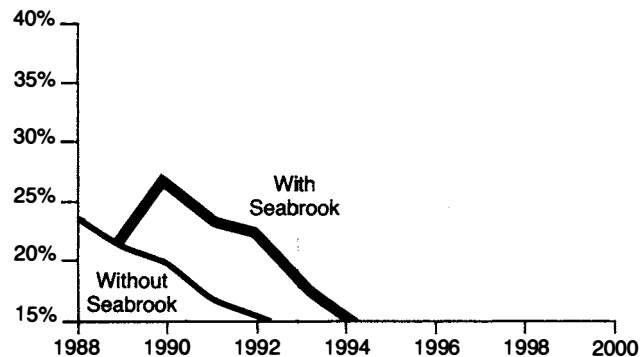
Part of that pressure was an incredible RICO suit (Racketeer Influenced Corrupt Organization) brought against LILCO last year, for "misleading the ratepayers" regarding the cost of the plant. Though the case was thrown out of court by one judge, neighboring Suffolk County is still planning to sue LILCO for damages.

The utility is ready to hand the plant over to the State of New York for \$1, to divest itself of its \$5 billion investment. Governor Cuomo has sworn that the state will force the dismantling and decommissioning of the ready-to-operate power plant, so another governor could not reverse his decision in the future!

The state, however, has no intention of bearing the \$300-500 million cost of decommissioning Shoreham. That financial responsibility will remain with LILCO, and will be paid for by the ratepayers through a seven-year series of rate increases. The New York region already has the highest electric rates in the country.

What the effect of this stupid policy decision would be on the real-life electric supply situation in New York was graphically demonstrated to the Senate Committee on Energy and Natural Resources on April 13, by Deputy Secretary of Energy W. Henson Moore. **Figure 7** is a graph from his presentation which shows that the capacity Shoreham represents will make an important difference in the reliability of electric power in the region—it gains time to plan additional capacity, as reserve margins fall continuously throughout the

FIGURE 6
Reserve margins in New England
2.5% annual demand growth 1988-2000



Source: Energy Information Administration.

next decade.

But the fight over Shoreham isn't over yet. On June 13, Moore sent a scathing letter to the chairman of the New York Power Authority, warning that if the NYPA goes along with Governor Cuomo's plan to have Shoreham sold to the state, it could be in big legal trouble.

Moore's letter, which was also sent to Attorney General Richard Thornburgh, states: "I write to urge that you reconsider and reject this arrangement. I believe that failure to do so will implicate NYPA's trustees in activities that are beyond their statutory authority. In addition, we submit that the arrangement is flatly inconsistent with the public interest, as defined clearly by the respective laws for which we are responsible stewards."

Noting the illegal way this decision was taken by executive fiat, ignoring elected officials in opposition to it, Moore writes, "I am informed that NYPA previously has embarked on major ventures only after specific authorization from the New York State Legislature. . . . In December 1988, the New York legislature rejected the proposed arrangement for Shoreham. . . . Unilateral action by NYPA to carry out this arrangement seems directly to contradict the decision by the legislature."

Moore goes on to detail various sections of the Power Authority Act which empower the institution to produce reliable electric power, not tear down plants or stop the development of nuclear energy.

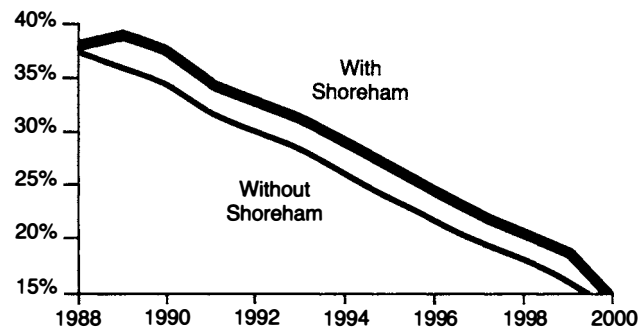
The Deputy Secretary also reminds the trustees that the Nuclear Regulatory Commission (NRC) would have to approve the transfer of the license from LILCO to the government agency that would be set up for that purpose, and Moore indicates that this approval is unlikely.

Moore ends his letter, a copy of which was also sent to

FIGURE 7

Reserve margins in New York/New Jersey

1.6% annual demand growth 1988-2000



Source: Energy Information Administration.

the chairman of the NRC, by stating: "As public officials, both our duty and our allegiance must be to the duly enacted laws that establish public policy, and not to a few influential officials whose irresponsible conduct is devoted to frustration of policies set by law. In this case the public policy established by the laws of New York counsels unequivocally that Shoreham's generating capacity must be used, not scrapped."

On June 28, LILCO's shareholders will vote on whether or not to take up the state's "offer." On June 15, Secretary Moore was on Long Island meeting with businessmen to try to convince them to vote against the proposal.

According to LILCO, the energy supply, again this summer, will be "very tight." George Loehr, acting executive director of the Northeast Power Coordinating Council stated that the situation is "too close to call." "There will be voltage reductions and public appeals" to reduce consumption, again this summer, he remarked.

Systems around NPCC, such as ECAR and Hydro-Quebec, have their own power constraints, he explained, and will not be able to export much power. If changes in policy are not made, New York/New England will get to the point of scheduling power outages, in order to ration the inadequate amounts of electricity generated, as is the case now in Argentina.

An inside-outside job

On June 6, for the first time in this nation's history, voters decided to shut down an operating nuclear power plant. Within 72 hours of the vote, the Sacramento, California Municipal Utility District (SMUD) had the 913 MW Rancho Seco plant in cold shutdown.

This one plant supplies 43% of the electricity for Sacramento, and its shutdown will force SMUD to purchase power,

at an added cost to its customers. Ironically, the reason for the vote was not that the community had been frightened into believing the plant was dangerous, but that it was uneconomical! The vote mandates that SMUD divest itself of the plant.

It is true that Rancho Seco had been out of service for two and a half years to catch up on maintenance and for modifications required by the NRC, and that other power had to be purchased while it was down. But now that \$400 million has been spent, the modifications have been made, and the plant is on line running well, it makes no sense to shut it down.

The recent vote was not really against the plant, but against the utility, according to Joe Buonaiuto, the president of the elected board of directors. He explained that at the polls, the citizens expressed their "exasperation with the political and administrative soap opera" that the utility had become. The reason was the election of two anti-nuclear ideologues to the board, whose political agenda was to shut down Rancho Seco.

The most outspoken, Ed Smeloff, was elected with support from the Tom Hayden-founded Campaign California, and has hampered SMUD's ability to effectively fight the initiative. His agenda is to substitute conservation and other environmentalist rhetoric for nuclear power. For three years, the board has been "destabilized" from within, according to Buonaiuto. The anti-nuclear minority on the board reports to the media the decisions the board takes that they do not agree with, which undermines the board's capability to carry out what it votes for.

Rancho Seco became operational in 1975 and has an operating license valid to the year 2008. Within approximately the next month, the plant can be sold to another company to operate it. After that, it would be more costly to bring it back into operation. That would avoid the irrational idea of decommissioning the plant, which would "turn it from a \$1 billion asset, to a \$500 million liability," as Buonaiuto explained.

But serious damage has been done to SMUD. Buonaiuto stated that SMUD's bond rating has gone to "one step above junk," and he feels that the "future of public power is on the line." When he first recommended that SMUD sell Rancho Seco even for a dollar rather than tear it down, the press called him the "General Noriega of Sacramento."

The leadership of the U. S. Department of Energy has been willing to step into the ring in the Seabrook and Shoreham nuclear plant situations. If a buyer is not found for Rancho Seco, it would be appropriate for a federal agency, such as the Bonneville Power Authority, to purchase and operate the plant.

The nation does not have the luxury to entertain destructive ideas, or implement idiotic decisions made for political reasons, because there is really no margin of safety left in the electric utility industry.