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the informed opinion

Electric Power Deregulation — A Bad Idea?

by Jack Casazza

The United States is now more than 15 years into an experiment to deregulate and restructure its electric power industry. Some claim the change has produced national benefits as high as \$30 billion per year. Others claim the change has resulted in penalties as high as \$30 billion per year¹. And still others point to major declines in reliability and increased frequency of blackouts.

Why are there such broad discrepancies? How do the results of deregulation and restructuring compare with predictions? Has the change benefited our industrial or commercial users, ordinary consumers and our national economy? To determine the answers to these questions, the key changes that were implemented must be reviewed.

Cooperation versus Competition

The nature of electric power systems requires significant investments in major facilities, typically costing from tens of millions to billions of dollars. These facilities have long construction lead-times, taking years from start to completion, and often remain in service for as long as 40 years. Regulation provided for the *return of the investment* (depreciation) and the *return on the investment* (earnings) over the facilities lifetime.

The systems were interconnected to take advantage of the diversity in times of peak use and in times of equipment failures and emergencies. The industry focus was on long-term cost minimization. Decisions were based on life-cycle cost analyses. In such an environment, a high degree of cooperation developed among those involved in owning, managing, planning and operating electric power systems². The national savings from this cooperation and interconnection were carefully studied many times and had increased to nearly \$20 billion annually³ by the late 1980s. Prices to consumers, controlled by state regulators, were reduced by these savings.

Many supporters of the introduction of competition into the electric power

business believed it would lead to significant economic benefits and price reductions to consumers. The move to have competition replace government regulation gained many adherents, particularly in large industry, where there were concerns over growing foreign competition; with economists in the nation's universities, who welcomed an opportunity to apply their theories; by investment bankers, who saw the huge fees they would earn to finance numerous buyouts and mergers; by lawyers, accounting organizations and some engineers, who saw increased business; and by entrepreneurs, who saw opportunities for huge profits. Some utility executives believed competition would help increase the return to investors that had, at times, been unfairly limited by regulators.

In general, those favoring competition as a driver were not aware of its effect on the benefits of coordination. Most lacked knowledge of power systems functioning and costs. The concept that profits would increase for the suppliers while prices would go down for consumers obviously required major cost reductions. But no analyses of the source of these cost reductions were conducted by competent engineers. Rather, it was the common belief they would result from increased competition.

Have such cost reductions occurred? The answer is clearly no. There have been some improvements in generator unit availability and efficiency. On the other hand, there have been huge additional costs and cost increases stemming from the reduced benefits of coordination, the increased complexity of the system, scheduling, and other operating procedures.

Lack of Cost/Benefit Studies

Adequate cost/benefit studies were not conducted prior to the adoption of new policies. As Joseph Swidler, former chair of the Federal Power Commission, the Federal Energy Regulatory Commission's (FERC) predecessor, said in a 1990 editorial in the *Electricity Journal*⁴, "While there is bitter disagreement over ... changes, there can be little argument these are occurring haphazardly without the benefit of comprehensive analyses at a national level." A specific example is the absence of an analysis of the decrease in benefits from coordination as mentioned above, since competition typically results in decreased coordination.

Failures to undertake cost/benefit studies persist today. The establishment of independent system operators (ISOs) and regional transmission organizations (RTOs) to replace prior coordination mechanisms, such as power pools, has resulted in significant cost increases. Available data shows a ten-fold increase is typical, with a national increase of several billion dollars per year⁵. Advance analyses to determine cost increases and whether they would exceed potential benefits were not conducted — and are still not being conducted today.

While many studies have been publicized purporting to show past benefits and projected future benefits, the basis for these comparisons merits careful evaluation. The key questions are: to what are the revised procedures being compared? Were they based on prices or costs? Prices are determined by commercial policy, taxes, subsidies and competition, i.e., human decisions. Costs are determined by capital investments, fuel and labor costs, as well as system plans, designs and operating procedures. Costs must be reduced to

achieve national economic benefits.

Individuals and organizations have compared existing and proposed market operations with individual system operations, without considering the former coordination and power exchanges that produced billions of dollars in annual savings. I was involved for many years in the Pennsylvania-New Jersey-Maryland (PJM) integrated power pool activities. During that time, I saw monthly statements showing the total benefits of the pool operation and the benefits to my company. I have never seen PJM, or any other pool, present an analyses comparing the benefits of coordinated pool operations with the new competitive procedures — or comparing costs, and staffing requirements of operation with those that resulted from restructuring.

All independent analyses that have been made comparing competition with cooperation show that restructuring and deregulation have resulted in higher costs. Have cost increases exceeded cost reductions? The answer from the studies that compared new competitive procedures with former cooperation is clearly yes. These studies all show that deregulation has not yet benefited consumers or the national economy.

Engineering Competence Versus Economic Theory

Since deregulation, a major shift has occurred in the qualifications of those controlling electric power policy and managing electric power activities. For most of the 20th century, the majority of those directing such activities were engineers. With deregulation and restructuring, however, the emphasis shifted from technical knowledge and competence to marketing and financial knowledge. The driving force behind public policy decisions became economic theory rather than engineering facts. This shift at the top led to a de-emphasis of technical knowledge at all levels. While some engineering salaries were increased significantly for those willing to support the new culture, the role of engineers was, in large part, supplanted by what some call “bean counters.”

The system planning departments that existed in most companies were dissolved. The transfer of past experience and judgment to new engineers and managers ceased⁶. Support for power system education in our universities decreased. Key management positions engineers held declined.

Many new managers were driven by the desire to make profits “now.” They sometimes had huge bonus arrangements tied to these profits. To cut costs, they reduced power system facilities maintenance (and tree trimming) and made sharp reductions in personnel. In the ten-year period from 1990 to 1999, labor employed by investor-owned utilities decreased from 480,000 to 350,000. Department of Labor data shows national utility employment in power generation dropped from 350,000 to 280,000 between 1990 and 2000, and from 196,000 to 156,000 in transmission and distribution, while electric consumption continued to increase.

Training reductions were one consequence, since sufficient personnel were often not available to free up others for training programs, as in the past. At a FERC technical conference in Philadelphia, one system operator said, “We have downsized quite a bit of our operating staff ... There is not a whole lot of time left for training.” An independent European analysis has concluded that personnel reductions also played an important role in the recent blackouts

there.

Some among the new regime “cooked the books” to show false profits and earn bonuses. They replaced generation schedules, formerly based on producing power so as to minimize total production costs, with generation dispatch based on quoted prices. During shortages, this approach has resulted in skyrocketing prices — sometimes as high as one hundred times the normal rate. Common new procedures called for payments in any period to be based on the highest accepted bid, not the bid a supplier had made, often resulting in payments considerably higher than bid price. “Game playing,” in which generating capacity was withheld from service to drive prices up for their other generating units, became routine, further increasing the total cost of electricity and exacerbating reliability problems.

Over the past 15 years, the federal government’s focus has been on facilitating markets for electric power. It still is. Policies have been dictated by economists and supported by those in industry and the various professions who expected to gain financially. Reliability became secondary to profits in some companies. In government, some believed that top appointments required political skills and economic knowledge, and that engineers were lacking such skills. Both FERC and the Department of Energy have struggled to fill key positions requiring the technical background necessary to ask crucial technical questions about proposed policies and activities. Too often, the powers that be established new rules and procedures that encouraged bad behavior with no analysis of their potential effect on reliability.

And lastly, the belief that market forces can be used to design an efficient and reliable power system has permeated both the government and some power industry executives, ignoring that markets are driven by immediate profits, not long-term optimization. The change in leadership has harmed our nation, our industries, our consumers and our engineering profession.

Conclusion

Deregulation of the electric power industry was a bad idea. It resulted in a complete industry restructuring, an increase in costs, and a decline in reliability. While the prior procedures had problems, mostly caused by poor regulatory procedures, doing away with regulation was not the answer, improved regulation was. If a car has a transmission problem, you don’t solve the problem by replacing the engine.

Additional Reading

Some sources of additional material with similar conclusions are:

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- “RTOs: What’s to Regulate?” Dr. Robert Michaels, Cal State, Fullerton
- “Restructuring at the Crossroads,” *APPA*, December 2004
- “What’s Wrong with the Electric Grid?” Eric J. Lerner, *The Industrial Physicist*, October 2003
- “Electricity Competition is Bad for Your Pocket Book,” Dr. Dominic Maclaine, University of Sussex, dominic.maclaine@btconnect.com
- “Electricity: Learning from the Shocks,” *Toronto Globe and Mail*, 15 July 2004
- “Can Energy Markets Be Trusted? The Effect of the Rise and Fall of Error and Energy Markets,” Prof. Jacqueline Long Weaver, University of Houston Law Center, *Houston Business and Tax Law Journal*, Vol. 4, 2003
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4. “A Brave New World: Let’s Look Before We Leap,” Guest Editorial by J.C. Swidler, J.A. Casazza, A.J. Schultz, *Electricity Journal*, Nov. 1990
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6. “Why Have Lessons Learned Not Been Transferred to the Current Generation of Power System Engineers, Managers and Policy Makers

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