ARE WE BETTER OFF?

BY ELLIOT ROSEMAN, CLASS OF 2001

For those employed in the electric industry in North America, August 14, 2003, was literally a dark day. A day in which more than 50 million consumers in eight states and Canada were left without power is not soon forgotten. The public, however, which a year ago was regaled with industry terms such as "loop flow" and 230 kV lines, has quite understandably moved on. Other issues have taken over the headlines, and the "juice" has seemingly been restored to its normal, highly reliable state.

But are we better off now than we were just over a year ago? This article explores both the qualitative and quantitative aspects of the actions taken since August 2003, and provides a checklist for determining where we go from here.

To begin with, a few facts:

The incidence of Transmission Loading Relief (TLRs), or unfulfilled transactions due to grid constraints, has continued to rise. It is up by 10% in 2004 on an annualized basis since the blackout last year, on top of a five-fold increase in the four years before that.

In a recent publicly released assessment, ICF Consulting announced that transmission investments are not being optimized. Over $40 billion in 2003 dollars (including $8 billion to reduce power costs) should be invested in transmission through the year 2030 to provide the optimum level of both reliability and economic benefits, with a highly positive cost-benefit ratio.

This same study shows that reducing the incidence of all transmission-related outages (not just major blackouts) could benefit the economy - that is, the gross national product - by nearly $50 billion (net present value) over the same period, which justifies additional investment in the grid.

Another recent study indicates that although transmission investment has risen substantially in the past four years, it has not nearly kept pace with the growth in power demand, so the line-miles of transmission per MW of peak have continued to fall, continuing a trend that has lasted for nearly three decades.

In this context, are we better off since the blackout? Much attention has been focused on reliability since then, but is it enough? The answer to these questions are complex, and a function of many factors - in fact, the answers lie in exploring both human factors and capital allocation. If power companies intend to improve transmission investment and preserve the reliability of power supply, we must first define the tangible criteria by which to measure improvement.

PLUSSES AND MINUSES

ICF Consulting considers the state of the transmission system to be mixed in its ability to avoid blackouts and enhance reliability, compared to August 2003. In some areas, there have been tangible improvements, while in others, little progress is apparent. Of course, it takes time for capital investment programs to come to fruition, but we can judge today whether the plans and precursors to such investment appear to be in place. Since last August, the most progress appears to have been made in the qualitative or human areas. Here is our scorecard of what's been going well, and what has not:

PLUSSES

To follow up its report on the causes of the 2003 blackout, DOE and Natural Resources Canada recently assessed what has been done since last August and together published a report detailing the remedial actions taken since then at the Federal Government and the North American Electric Reliability Council (NERC) levels (interestingly, the report did not study actions at the state level). Understandably, the report focused on the region where the blackout took place and on the utilities deemed responsible, but the task force recognized that the issues were more universal. That report, combined with ICF Consulting's assessment, identified the following major improvements in the past year:

1. System Operator Training - NERC issued a new requirement for system operators to receive five days of emergency preparedness training every year.

2. Utility Audits - NERC has carried out several dozen audits of the state of transmission reliability and readiness at major utilities throughout the country. These audits need to be expanded in the Western US and ERCOT regions.

3. FERC Action - On April 19, 2004, FERC required utility compliance with reliability standards under its Open Access Transmission Tariff.

4. DOE Focus - DOE's Office of Transmission and Distribution has focused on a dialogue on "National Interest Electric Transmission Bottlenecks" (NIETBs).

5. Selected Investments - Certain high-profile lines (e.g., the Arrowhead-Weston line between Wisconsin and Minnesota) have received final approval. Nationwide, utility vegetation management programs have markedly increased, with some states setting mandatory standards.

6. Plethora of Reports - There are a number of required reports or studies underway focused on improving system operation.

MINUSES

While not trivial, and certainly responsive to the crisis, there are also actions that have not been taken, and which could improve long-term preparedness and prevent future reliability issues and blackouts.

1. Balkanization - The number of entities that oversee and have some jurisdiction over electric transmission still numbers in the hundreds, including more than 50 state commissions; regional reliability councils; RTOs and Independent Transmission Companies (ITCs); and all the transmission-owning municipal and cooperative entities nationwide.

While the RTOs in place (e.g., MISO, PJM) have issued transmission plans for the past few years that identify desirable investments, those plans have little real "teeth," or proactive penalties for not following their recommendations.

2. Capital Investment - We need more "iron in the ground." In spite of recent additions, NERC projects that high-voltage transmission investment will increase far less than the anticipated growth in demand.

3. Lack of Legislation and Reliability Standards - With the Congress' failure to pass energy legislation last year, the drive to pass mandatory reliability standards has withered. NERC audits have helped, but are a poor substitute for federal requirements. Without legislation on "backstop" authority, there is no way to break a logjam on transmission siting, which can occur for both new lines and upgrades to existing ones.

4. Unclear Role for FERC - FERC is focused on getting several RTOs (e.g., Southwest Power Pool (SPP), Midwest Independent System Operators (MISO)) approved and up and running, and due to staunch opposition, is largely leaving areas in the Western and Southern U.S. alone for the time being.

5. Level of Congestion - The major bottlenecks that were in place last August are by and large still there. More importantly, there is no apparent process to compel companies to alleviate those bottlenecks. The same process that has always existed to assess the need for new transmission remains in place, which is to say, one that tends to favor generation.

6. Communications - The protocols for communications and for monitoring the state of the grid appear little better now than in 2003, except for MISO.

7. Prominence of Transmission - EEI has urged utility CEOs to participate in NERC regional reliability councils to raise the profile of grid concerns.

RECOMMENDATIONS

ICF Consulting believes that North America is still vulnerable to another major blackout. In light of this scorecard, what should we do?

1. Take a more holistic viewpoint. There is a benefit from inter-state coordination that is not currently being realized. There should be more efforts for state regulators to meet jointly to consider transmission lines that would benefit their regions.

2. Pass mandatory reliability standards and payments. These standards should mandate common reserve margin requirements for the grid. There should also be appropriate payments for VAR support.

3. Resolve the "who pays" debate. A major stumbling block has been whether transmission customers or transmission users (e.g., Independent Power Producers) should pay for system upgrades. Most developed countries (e.g., Canada, the UK) have made the decision that if a user of the system passes other requirements (e.g., their power is "needed", and they meet permitting and environmental requirements), that all customers should pay for the system additions, while the developers should pay only the direct cost of interconnection.

For high-priority, high voltage lines, there is a strong argument that the U.S. Federal Government should pick up all or part of the costs, as it did with the construction of the federal highway system.

4. Minimize reliance on human interaction. As NERC has begun to do, utilities should put in place many more electronic/automatic sensors to provide a fail-safe system that will identify grid problems.

5. Unbundle transmission. Support the creation of more stand-alone transmission companies, such as in Wisconsin and Michigan, whose sole focus will be on transmission, without having to balance investment between generation, transmission, and distribution. These entities should have performance-based rates with incentives to reduce congestion and outages.

6. Support load management. FERC and the states should greatly increase the use of programs to reduce stress on the system by better managing load in peak times.

7. Use new approaches. Inject "value of lost load" techniques into regulators' evaluation of whether to build new transmission lines to reflect the benefit of transmission reliability to the state's and region's economy. DOE and the utilities should continue and enhance support for innovative technologies to enhance reliability and grid throughput.

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