

SPP's Vision

THE FUTURE OF TRANSMISSION EXPANSION

BY LES DILLAHUNTY



Southwest Power Pool has a vision for the

future of transmission expansion. It involves an

interregional network of extra-high voltage transmission lines bringing electricity, including potentially tens of thousands of renewable megawatts, to load centers. Such a system would allow more electricity to be moved efficiently across the grid, equivalent to traffic flowing on a six lane interstate super-highway compared with the state highway grid of today.

SPP's mission is to help members work together to keep the lights on, today and in the future. Transmission planning plays an integral part in our mission, ensuring that the grid of the not-so-distant future can meet the evolving needs of load-serving entities. SPP, which serves as a Federal Energy Regulatory Commission regional transmission organization and a North American Electric Reliability Corp. regional reliability organization, conducts ten-year transmission planning studies, as required by NERC. However, we recognized the need to develop a longer-term approach to planning. We wanted to look further into the future, to the year 2026 and beyond, to address issues of regional and interregional importance.

Last summer, SPP announced to stakeholders plans for an extra-high voltage overlay study that will provide the blueprints for the future of the transmission grid for SPP and its neighboring regions. This report, independently prepared by Quanta Technology and PowerWorld Corp., strategically assesses SPP's future reliability and capacity needs. To meet those needs, it suggests overlaying the SPP footprint with a 500- and 765-kilovolt transmission system and integrating it with the existing extra-high voltage systems of Entergy, MISO and PJM Interconnection.

An SPP extra-high voltage overlay would enhance reliability with a stronger transmission system for the communities within SPP's footprint. It would provide greater access to abundant, environmentally friendly, renewable energy from existing and potential wind farms in the South Central portion of the United States. It also would enable SPP to become an even more integral part of an enhanced transmission system extending across the Eastern Interconnection as well as the Electric Reliability Council of Texas and Western

Electricity Coordinating Council markets, increasing access to a variety of generation resources.

We are updating the study to include a full economic assessment of alternatives, including a 345-kilovolt option, along with forecasts in an upcoming American Wind Energy Association and National Renewable Energy Laboratory wind report. SPP and its stakeholders will reassess the extra-high voltage overlay study every two to three years to ensure that it remains on track and valid.

The extra-high voltage study meets the regional planning principle of the Federal Energy Regulatory Commission's Order 890, which requires transmission providers to coordinate with interconnected systems to share plans and identify enhancements.

JOINT PLANNING

The extra-high voltage study will do much to meet the long-term planning needs of SPP's system, but the scope of such a project stretches far beyond SPP's borders. We recognize the need to work with neighboring entities to plan for and build transmission on a continental scale. In 2007, SPP, in conjunction with the Midwest ISO, PJM Interconnection, and the Tennessee Valley Authority, initiated a joint coordinated system plan to focus on interregional, collaborative transmission expansion plans to address reliability needs. SPP represents its regional transmission organization footprint as well as the planning interests of Entergy Services and E.ON in the planning effort.

Plan participants will develop common power system analysis models, regularly conduct a coordinated regional transmission-planning study and meet at least semi-annually to review and coordinate transmission-planning activities. In addition, they will establish working groups as necessary to address specific issues and conduct the necessary stakeholder review and approval process.

The plan participants are collaborating with the Department of Energy and the National Renewable Energy Laboratory on a major wind integration and transmission-planning study, expected to be published this year. The study will determine the long-term transmission expansion plans needed to support a 20 percent or higher national renewable portfolio standard, and evaluate and quantify the operational impacts, ancillary service requirements, and reliability margin impacts associated with large wind development in remote portions of the United States that have the best wind resources.

The study will also address specific questions. What are the benefits of long-distance transmission that moves large quantities of remote wind energy to urban markets? Does geographical diversity help reduce the system variability and uncertainty associated with intermittent resources? What additional system operational impacts and costs are imposed by wind generation variability and uncertainty? How does wind generation capacity value affect reliability?

We will face challenges as we move forward with extra-high voltage and joint planning projects, the first of which will be determining who will pay for the upgrades. SPP's regional state committee has been working on solutions to this question in recent years. In 2004, the committee determined a cost-sharing mechanism for reliability upgrades that shares a portion of costs across the SPP region. That 2004 initiative



has been successful in spurring transmission expansion. The committee recently approved a policy for a cost allocation method for economic upgrades. New transmission, whether it is built for reliability or economic reasons, will not become a reality without some assurance of cost recovery.

Efficient and effective seams agreements, which determine how neighboring transmission providers interact at their borders, will be a critical step in the implementation of any major extra-high voltage developments for interregional projects. While existing seams agreements address cost recovery for transmission projects that clearly provide mutual benefits, a methodology must be developed to address larger projects that could provide major economic benefits today and in the future. Transmission interests must find ways to work together whenever possible, while preserving the uniqueness that is important for specific needs.

Another major challenge with long-range planning is uncertainty about what the future holds. The list of uncertainties is long, including the impacts of demand response, energy efficiency, and environmental standards; technological developments; the aging of the industry workforce; turnover among our regulatory colleagues and future market developments.

A NATIONAL APPROACH

FERC Commissioner Suedeen Kelly believes that the United States needs a national approach to transmission planning. In a July order, she stated, "In order to truly capture

not only the benefits of competition in generation but also to facilitate increased use of renewable resources, I am convinced that we will need not just to upgrade our electric grid but also to reconfigure it." She continued, "We need a true nationwide transmission version of our interstate highway system; a grid of extra-high voltage backbone transmission lines reaching out to remote resources and overlaying, reinforcing, and tying together the existing grid in each interconnection to an extent never before seen. To get to that end state, we must have cost allocation provisions in place that can accommodate such wide ranging benefits."

FERC's emphasis on increased transparency in interregional transmission planning, for both reliability and economics, is a major step in the right direction. The industry would benefit from standards for seams agreements between transmission providers, which could include fair and simple cost allocation methodologies. The prospect of negotiating numerous interconnections, with endless debates and analysis of project beneficiaries, is daunting.

The United States bulk power system is the most complicated and extensive machine in existence. The talented people who operate it must now find a way to make fair and efficient cost allocations and seams agreements a reality to ensure the reliable supply of electricity to meet the ever-growing needs of electricity consumers.

Les Dillahunty is Southwest Power Pool vice president of regulatory policy.



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