Introduction

On March 12-13, 2002, the National Wind Coordinating Committee (NWCC), in cooperation with regional stakeholders, held a two-day workshop: Planning for Electrical Transmission Needs in the Upper Midwest. The workshop was the outgrowth of an effort to develop a forum and process for consideration of transmission options that strives for equitable allocation of benefits and impacts among all affected parties. The goal of this workshop was to provide a catalyst for an enhanced, inclusive process for transmission planning with participation of and acceptance by all affected stakeholders. Participants in the meeting included representatives of state and regional regulatory agencies, utilities and power generators, the wind industry, environmental and landowner interests, and other interested parties (see Attachment A for a list of meeting participants).

Tuesday, March 12, 2002

Welcome and Introductions

Abby Arnold, RESOLVE, welcomed everyone to the workshop, noting that a broad range of stakeholders were present. Following Ms. Arnold’s remarks, participants introduced themselves.

Charlie Smith, Electrotek, welcomed the participants and then reviewed some of the NWCC’s past activities to provide a context for NWCC interest in transmission in the Midwest. (See Attachment B for copy of Mr. Smith’s slides.) He reported on three prior workshops sponsored by the NWCC and related organizations at which the participants identified and clarified transmission issues related to development of wind power and developed principles to address the issues. He explained that the NWCC role in the regional transmission organization (RTO) process has been to track the progress of various RTOs, seek a level playing field for wind in development of respective RTO policies, and provide outreach and education. Mr. Smith noted that the NWCC has identified the following issues as critical to fair treatment of wind in evolving markets:

- Transmission planning process,
- Balancing markets,
- Markets for transmission rights,
- Interconnection standards and policies,
- Congestion management, and
- Rate pancaking and tariffs.
Mr. Smith also noted that the NWCC has prepared four case studies that provide the layperson with an illustration of these and other issues. He commented that the case study focused on the Midwest points out some key issues in the region: there is a long distance between wind generation and load, and the transmission system is often congested. He noted that both of these issues are broader than wind interests. All four case studies pointed to the following important conclusions:

- Stakeholders have different perspectives and conflicting conclusions on the need for new transmission.
- An improved regional approach to resolving transmission planning issues must be found.
- Transmission upgrades needed for wind development will benefit multiple generators and will likely face continued environmental and community advocate opposition.
- A new approach that will produce renewable energy, environmental, and transmission abutter benefits may be required.

Ed DeMeo, Renewable Energy Consulting Services, presented the workshop aim and approach (see Attachment C for copy of Mr. DeMeo’s slides):

- Assist in expanding forum for regional transmission planning.
- Build on established and evolving MISO-MAPP process.
- Encourage long-term planning through discussions of plausible alternatives for the future.
- Facilitate articulation of views and issues.
- Encourage ongoing forum and process under regional leadership.

**Stakeholder Perceptions of Transmission Planning in the Midwest**

A few meeting participants shared their perspectives about transmission in the Midwest:

Tim Rogelstad, Otter Tail Power, described the transmission planning process as good and getting better. New legislation in Minnesota now solicits plans from all interested and affected parties. The new process includes many more stakeholders and encourages more long term planning to identify future transmission needs and solutions. He noted that the challenges to Midwest Independent Transmission System Operator (MISO) include a lag in infrastructure development in the short term; siting, routing, and land acquisition issues; and identification of resources for transmission improvements. He pointed out that generation and transmission planning have been separated in the past but will be combined under the RTO concept, which should enable some resolution of these issues.

Michael Noble, Minnesotans for an Energy Efficient Economy, stated that transmission is a controversial issue for environmentalists and landowners. He noted the need to promote energy efficiency to lessen the need for new transmission capacity and the belief that wind will be a major part of the nation’s energy future. Mr. Noble stated that we should encourage transmission projects that support large and small wind energy development, but he cautioned against a public dialogue about transmission capacity for wind that in the end is used for transporting coal generated electricity. He commented that in order to gain environmentalist support, projects would need to show “net environmental benefit.” He acknowledged that the
environmental community stands as a potentially powerful ally, but only if added transmission capacity supports environmental improvement.

Jim Caldwell, American Wind Energy Association, stated that the real problem is total transmission capacity, particularly with respect to secondary feeder lines. He acknowledged the difficulty in attributing specific changes to specific projects and noted that the scope of changes in the system may be incompatible with wind generation in terms of time, size and space. The planning needed to increase transmission capacity takes years, whereas demand for new capacity is current. In regard to size and space, transmission lines cross regions and states, whereas wind projects are developed at the county level. Mr. Caldwell noted that the key planning issue would be the integration of generation and transmission planning stages. He also stated that the body politic must support the planning process.

Jeff Webb, MISO, characterized MISO as a stakeholder driven organization, with room for evolution as the RTO development process moves forward. He noted that the Mid-Continent Area Power Pool (MAPP) is ahead of others in the coordinated planning process and that MISO would continue that trend. He commented that a key issue is that many energy resources are long distances from the load centers, requiring longer lines for transmission and adding complexity to the operation of the system. He noted that the new MISO RTO will have ultimate responsibility for transmission planning in the area and will need to be responsive to all stakeholders. MISO intends to develop a five-year plan that will ensure reliability, provide signals for appropriate development of the transmission grid, and create incentives for transmission investors.

Ed Garvey, chair of the Minnesota Public Utilities Commission, stated that regulators must ensure that transmission serves the public interest, offers consumer value, and balances supply, demand, and delivery issues. He acknowledged that regulators will have to overcome many hurdles to foster the development of wind energy and noted that the transmission planning process must include all stakeholders and provide certainty.

A meeting participant observed that wind potential is abundant in the Upper Midwest and transmission is needed to move wind energy to load centers. Another participant said that landowners and county officials must be invited into the discussion. Some participants commented that landowners need to be at the table once more specific information is available on routes under consideration. Others noted that it is important to bring landowners in early so they are part of the routing process.

Current Transmission Planning and Alternatives for the Future

Tom White, MAPP/MISO, outlined the MAPP planning process as it transitions to the MISO RTO. (See Attachment D). He noted that MAPP published a regional plan that covers 2000-2009. The process depends on subregional planning groups (SPGs) to think about base load planning from the local perspective. The SPGs provide input for the design review process. Throughout the planning process MAPP looks at load serving and market use; considers regional and local needs; plans for firm use but includes all uses as indicators of system strength; and includes all known plans.
Mr. White noted three sources of information:

- SPGs’ studies of future construction,
- Open Access Same Time Information System (OASIS), and
- Export limits.

He reported that the region gets nearly 100,000 OASIS requests per year. Thirteen percent of the requested energy transfer is never confirmed, and 2% of scheduled energy transfer is curtailed. Mr. White commented that 2% curtailment is low compared to other parts of the country, but he noted that the curtailment is low largely because 13% of the requested transfers are denied. Transmission line load relief (TLR) is..., [need layperson’s definition]. Low TLRs are desired. Mr. White noted that TLR’s are much higher in other parts of the country. He explained that the cumulative effect of all confirmed business loads up transmission lines. Key groups of lines that are at risk of realizing too much loading (called “interfaces” or “flowgates”) are monitored. These flowgates pose obstacles to getting new or increased electricity out of the region. In response, the MISO is studying transmission export limitations and causes of congestion.

Mr. White stated that due to physical constraints, the existing transmission system will not accommodate some of the additional generation projects envisioned by various constituencies. He said that the challenge is to solve this problem efficiently, environmentally, and at the least cost. He also told the group that the current process does not look at possible future technological advances that may improve transmission. Transmission technologies must be proven and commercially viable to be included in any planning process. In the future, however, MISO will try to look at technological innovations, such as non-wire solutions, particularly through the SPGs.

Wind Power Development in the Upper Midwest

Matt Schuerger, consultant to Wind on the Wires, and Beth Soholt, Wind on the Wires, presented the Wind on the Wires proposal for addressing transmission issues related to wind development. (See Attachment E for copy of slides).

Mr. Schuerger stated that the Midwest region has tens of thousands of megawatts of wind power potential. He commented that the cost of producing electric energy from wind power has declined and will continue to decline. He noted that a number of new wind projects that will require transmission are being planned. Two dozen studies have been done on the need for new transmission to support specific developments in the region. Mr. Schuerger noted that Wind on the Wires is tracking these studies, and a number of them have incorporated large blocks of wind. He presented a slide that tracked the “phase angles” across the main transmission system.

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1 From a layperson’s perspective it is useful to think of the transmission grid as a highway with on and off ramps. When too many cars are lined up to get on or off the highway, congestion occurs; if too many cars are on the highway, traffic slows – sometimes to a standstill. If the highway stopped at a state line and there were checkpoints, traffic would stop. If a new community developed and wanted to be connected to the highway, studies would be conducted to determine whether the existing highway could absorb additional traffic at that site and what the overall impact would be to the system. These same principles apply to the transmission grid, with the added complications of the physics of electricity flow. The MAPP planning process is designed to address these issues from a technical perspective.
The slide illustrated the demand or load centers and the generation centers and highlighted the strains and stresses on the current system. Mr. Schuerger commented that the studies being conducted identify a number of corridors in need of reinforcement, particularly along the constrained interfaces. He noted that a process to look at all of the corridors comprehensively, as opposed to incrementally, would be useful and could occur under the MISO planning process.

Ms. Soholt, described the Wind on the Wires (WOW) regulatory program and highlighted the issues WOW has identified as priorities. Issue categories include:

- Near-term transition issues,
- Environmental considerations, and
- Landowner factors.

Ms. Soholt offered options for addressing the issues and concluded by stating that:

- There is potential in the upper Midwest for thousands of megawatts of wind power.
- Multiple studies have identified the same key corridors.
- Until appropriate market mechanisms are in place and fully functional, wind will face “rules of the road” challenges.
- Regional transmission planning must:
  - include environmental considerations,
  - address questions of need for new transmission, and
  - have landowner participation.
- Stakeholders must find a way to move collectively from the planning stage to implementation.

**Possible RTO Market Futures**

Ron Lehr spoke about the issues that could possibly affect future RTO markets. He noted two sets of decision makers: private decision makers, who base their decisions on investments against returns, and public decision makers, who consider public interests in their solutions. Mr. Lehr argued that we need a mixture of disciplines—economic, engineering, and public involvement—to generate the best outcome. He pointed out that reliability alone is a necessary but not sufficient consideration in transmission planning and that identifying the risks associated with transmission projects is an important first step.

Mr. Lehr expressed his view that the RTO concept is a workable one. He noted, however, that as electricity becomes more of a commodity, we will see boom and bust cycles as part of a system that will be dynamic in ways we cannot foresee. He described the market for renewable benefits as more expansive than just delivering electrons, noting that obtaining data to study these benefits will be difficult in a competitive environment. He commented on the importance of quantifying net environmental benefits and figuring them into the transmission planning process. Mr. Lehr urged the group to consider state needs, particularly the advantages and disadvantages of being part of a larger grid and the concerns for transit states. He also pointed to potential economic opportunities for landowners to site transmission on their property, commenting that the gas industry might serve as a model.
Responding to questions about pricing issues, Mr. Lehr stated that the current system is not price responsive and suggested ways to allow consumers to respond to higher prices, including purchasing energy efficient equipment and load management. One participant suggested a system in which the load consumers would pay for transmission infrastructure rather than the generator, as is currently the case. Mr. Lehr commented that such a system would send a better price signal to consumers. Another participant commented that the idea is a good one if generation can be matched to the load that uses it.

Acknowledging that the RTO model will provide the framework for the new system, several participants commented that the important questions are what will the RTO look like and how will the region transition to the new model. One participant noted that the details of the transition and the new model will be important for wind power. A major concern for proponents of the system will be the problem of investing in transmission infrastructure for a system that does not provide some certainty of a return on that investment. One participant expressed a concern that the RTO be politically viable and questioned whether the proposed MISO was politically viable.

**Process for Determining Transmission Improvements Needed to Accommodate the 2012 Situation**

Dale Osborn, MISO, presented the proposed planning process under the new MISO structure. (See Attachment F for a copy of slides.) He stated that the current MAPP planning process is a good one, and the planning process under MISO will be even better. He commented that regulatory officials need to receive more input from more stakeholders to make the restructured system work in the public interest. He suggested that wind proponents participate in the upcoming transmission expansion planning process, developing generation projections that match demand to create economically viable plans.

Mr. Osborn described the proposed planning process as envisioned at this date. SPGs will submit transmission plans in May 2002, after which MISO planners will begin the process of creating plans for transmission upgrades over the next five years, beginning in June 2002. Additionally, planning advisory committees (PACs) will bring existing information and then examine broader options with stakeholder input.

Following Mr. Osborn’s presentation, participants discussed the barriers to sequential planning. Participants favored some attempt to transition from sequential planning to aggregate planning. Some participants suggested that the expansion planning process would ultimately yield an aggregate study plan based on the scenarios developed from stakeholder input. MISO officials acknowledged that while there remains a need to address generation and transmission needs currently in the queue, there needs to be an attempt to develop these aggregate proposals.

Tribal issues were also discussed. One participant commented that tribal interests should be represented at the table, particularly because of the large amounts of land owned by tribes in the Upper Midwest. Also, because of the different rules governing tribes, transmission and generation projects may occur more quickly on tribal lands.
Wednesday, March 13, 2002

Reflection on Day One Discussion and Next Steps

The second day of the workshop focused on assessing the previous day’s information and identifying next steps. The group identified two categories of wind issues to keep on the agenda: 1) planning issues affecting wind that can be addressed through RTO forums and 2) public policy issues best addressed elsewhere. The group recognized the need for aggregation of development needs to ensure that the transmission expansion plan looks at more than reliability concerns. The group also considered the development of transmission products that are suitable for renewables, including transmission capacity set asides for renewables.

Participants discussed the MISO transmission planning process at length. Initially, some parties asked how MISO would integrate state policies, such as Minnesota’s renewable energy requirement, into the planning process to evaluate various scenarios. A major concern from the previous discussions was the need to balance long-term planning against the real need to address short-term system needs. Equally challenging is the question of who will pay for system expansion. Participants acknowledged these concerns but argued that long-term planning must occur to benefit wind energy development.

Participants discussed options for an appropriate structure for a good transmission planning process that combines technical and policy needs. One participant suggested including policy screening criteria for analysis of scenarios. Another participant commented that citizen groups and the general public should be represented through various means. He added that MISO will need to design transmission lines with community input to prevent public opposition to transmission construction proposals. Others commented that the political and public stakeholders and the technical regulators will need to develop new interactions in the new MISO structure. A participant suggested establishing MISO ambassadors who are assigned to various stakeholder groups. These ambassadors would attend stakeholder group meetings to give updates and obtain input to take back to the MISO planners. Several participants voiced concerns that some public stakeholders would be unable to participate in the MISO planning process because of the time and expense required to attend meetings, draft proposals, etc.

Some participants suggested development of a fuel mix strategy. Such a strategy would include specific goals for percentages of renewables in the production portfolio, with timeframes established for incremental improvements toward an ultimate goal at a specified time. Transmission planning would be done with those goals in mind.

Participants also voiced concern about identifying resources to pay for transmission improvements. One idea suggested was to approach Congress to give the RTOs the ability to charge a universal access fee, similar to the one attached to all telephone bills, and use the funds for transmission upgrades.

Mr. DeMeo reiterated that the primary objective of this workshop was to expand the forum for regional transmission planning in the Upper Midwest. Participants expressed gratitude to MISO for opening the planning process. In particular, participants agreed that MISO should consider holding forums such as this one regularly around the region, adding that these discussions
provide a missing link between planning staff and regulators and the general public. Participants stressed that more outreach and communication would be necessary. In particular, they suggested that MISO consider an ad campaign to educate the public about new issues and the MISO planning process.

The group then began to identify additional stakeholders who are important to the planning process, including:

- Environmental groups
- Representatives from municipal/cooperative utilities
- Association of Minnesota Counties
- Association of Townships
- League of Cities
- The general public

Several participants supported the idea of working to reach consensus with these and other groups to present a united voice in regard to renewables. Other participants, however, pointed to the significant differences in needs and issues for the different renewable energy forms and urged participants instead to push vigorously for an open, fair planning process.

**Conclusions and Wrap-up**

MISO staff reminded participants of the proposed timeline for the planning process. They encouraged wind proponents to develop a wind scenario for consideration in the MISO expansion plan by June 2002. They explained that the scenario should outline a megawatt goal but would not have to specify where or how transmission would be built. They added that short of a scenario, it would be helpful to have some data on how much wind power the industry is considering. One participant suggested that one approach to developing realistic scenarios would be to perform a market assessment, showing where wind power would be sold. Jim Caldwell stated that the American Wind Energy Association (AWEA) would submit a plan to MISO, providing megawatt projections and possibly including injection points. The AWEA scenario would be a proxy for saying that wind development should occur in the region. AWEA would then work with the Planning Advisory Committee (PAC) to determine the feasibility of the plan by September. MISO staff will build models and evaluate options from the submitted plans between June and September and begin choosing the most promising plans in the fall.

Participants stated their support for this meeting and suggested that the NWCC consider convening another workshop in the fall to get an update on MISO’s planning process. Participants expressed particular interest in reviewing wind-related scenarios that might be submitted to MISO.