



## Regional planning

There are a number of recent and ongoing developments that could affect ATC and our customers.

- *The Joint Coordinated System Plan (JCSP) & the MISO MTEP09 Economic Study* – The purpose of the JCSP exploratory study is to identify conceptual transmission overlays that would support two possible futures: a Reference Future and a 20% Wind Future. This study investigates the conceptual overlays to interconnect and deliver the output of projected new generation including existing renewable mandates and up to a higher 20% wind penetration level across the Eastern Interconnect. It explores the issue of what would be the impacts if there were a national 20% wind energy mandate. The MISO MTEP09 economic study investigates two additional futures – an Environmental and a Limited Investment future. ATC has been participating in these study efforts to determine what impact these conceptual overlays would have on transmission development in and around Wisconsin.

### **Overview of the JCSP:**

The JCSP study is a joint initiative by MISO, PJM, SPP, TVA, MAPP, NYISO and NEISO in collaboration with the Department of Energy (DOE). Other interested parties, such as the stakeholders of the initiating entities, are also participating in this study. The JCSP study includes reliability and economic analyses. The reliability study performed for the year 2018 is led by PJM, while the 2024 economic study is led by MISO. The economic study is performed in coordination with the DOE's Eastern Wind Integration Transmission Study. Wind data/profiles developed in the DOE study will be applied to the JCSP study. The two studies will collaborate on the development of the conceptual overlay to accommodate the potential 20% wind energy mandate in some future year across most of the Eastern Interconnect.

Initial workshops were held in December 2007, January and February of 2008 to discuss the assumptions for the future generation/fuel forecasting, present the forecasting results, discuss the rules for generation siting and present these results for the Reference Future and 20% Wind Future. Future generation forecasting and siting are necessary assumptions/ingredients in the investigation of future transmission overlays. The forecasted future generators are included in the models of future years for the economic analyses, and partially included (in most parts of the Eastern Interconnect) for reliability analyses.



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The Midwest ISO proposed the idea of overlays with heavy HVDC components in combination with some EHV AC components. A number of workshops were held throughout June 2008 in an attempt to obtain stakeholders' input for the design of the conceptual overlays to accommodate the Reference Future and 20% Wind Future. Interim results of the overlays were presented in August 2008. Work is underway to further analyze the overlays.

The JCSP study is scheduled to be completed by the end of 2008.

- ❑ **MISO Day 2 Market** – On April 1, 2005, the MISO Day 2 energy market began operations. The energy market provides generation and transmission service for load-serving entities, as well as provides a mechanism to manage congestion on the MISO transmission system. The market-based method, which was approved by the Federal Energy Regulatory Commission (FERC), is a significant change from how these functions were historically performed.

Market prices (also known as locational marginal prices) are produced at various points in the MISO footprint. These prices represent the marginal cost of generation at the various points in the MISO footprint as well as the local marginal cost of congestion and losses. In the past, curtailing or interrupting transmission service was necessary for reliable system operations. However, with an energy market in place, system operators re-dispatch generating units in order to maintain reliability of the transmission system. The cost difference between the units that are run for reliability purposes and the cheapest available units results in the local congestion costs.

Due to the uncertainties of the startup of the energy market, FERC allowed the Wisconsin and Upper Michigan System (WUMS) load-serving utilities within the ATC footprint to reduce the effects of the Day 2 congestion management process for five years following the start of the market. While still participating in the energy market, FERC allowed these load-serving entities to be reimbursed for congestion costs associated with energy delivered from network resources located outside of WUMS.

- ❑ **Generation Deliverability** – Prior to the energy market, a network firm transmission service request on the Open Access Same Time Information System (OASIS) was required to obtain transmission service and designation of a generator as a Network Resource. Under an energy market, MISO uses an aggregate “deliverability” test, which, rather than studying a specific generator-to-load path, requires showing that the output of a resource is deliverable to the “aggregate” MISO energy pool without overloading the transmission system. If the resource passes the deliverability test, it is able to be designated as a Network Resource by a load serving entity with the MISO. This deliverability analysis is performed as part of the generator-transmission interconnection process.



- ❑ **Reliability Initiatives** – In the wake of the August 2003 blackout that affected the northeastern portion of the U.S. and adjacent portions of Canada, several root cause investigations have been conducted and preventive initiatives have been proposed. In particular, better documentation on vegetation management in transmission line rights-of-way will be required by FERC. In addition, FERC issued a proposed policy statement on reliability, indicating that federal legislation may be necessary to make adherence to reliability standards mandatory and enforceable.

We have initiated or continue pursuing several measures aimed at improving the capability of our system to withstand major disturbances and avoid widespread blackouts. Key measures include:

- ❑ implementing specific projects aimed at lowering vulnerability to extreme disturbances,
- ❑ devising new, faster protection schemes to improve system stability during disturbances,
- ❑ replacing several circuit breakers, particularly at generating stations, to improve system stability during disturbances,
- ❑ implementing complete global positioning system synchronization of relays to capture and analyze disturbance data,
- ❑ continuing multiple contingency analyses of our system,
- ❑ working with MRO and/or RFC on extreme disturbance studies to consider the effectiveness of under-voltage load shedding,
- ❑ investigating enhanced visualization tools for ATC's control rooms and
- ❑ investigating use of high technology reactive control devices at critical locations on the ATC system.

## ❑ **MISO MTEP Planning Studies**

Midwest ISO's MTEP planning has adopted an approach that investigates transmission expansions for the long term, short term and for targeted issues/needs. The long-term studies are primarily value-based economic studies looking into the 10 to 20 year horizon. Conceptual transmission overlays are proposed based on a value/economic view of future years utilizing an array of assumptions. This approach is often considered a "top-down" approach. The short-term planning looks into the five-year horizon and is thus far primarily driven by reliability needs and compliance with NERC reliability standards. To date, the projects that address short-term reliability needs have been proposed to MISO by individual Transmission Owners. Need drivers and alternatives are then verified through the MTEP process and studies. This approach is often considered a "bottom-up" approach. The targeted studies investigate specific issues and the time frame can be between long- and short-term. The short-term and targeted studies usually follow a one-year planning cycle. The long-term economic studies typically follow a two-year planning cycle.



The MISO footprint is divided into three sub-regions for planning purposes: western, central and eastern. The ATC footprint falls within the western sub-region. Some of the MTEP planning activities are organized by sub-region, while other activities are coordinated through workshops with all interested stakeholders' participation.

### MTEP 08 reliability studies

The ATC Planning staff participates in the MISO MTEP 08 reliability studies in order to ensure the correct representation of our projects and their associated needs. These activities include:

- Populating ATC project information in the MISO project database,
- Participating in building/reviewing the MTEP models,
- Providing project need drivers for ATC projects,
- Answering questions related to our projects at the western Sub-region Planning Meetings (SPM),
- Reviewing and commenting on MTEP study results, to ensure successful inclusion of our projects in the MTEP Appendix A in a timely manner, and
- Ensuring the appropriate cost allocation for those ATC projects eligible for regional cost sharing.

### MTEP 08 targeted studies

ATC Planning staff participates in the targeted studies in the MTEP 08 cycle. Two of these studies are discussed below.

#### *The Narrowly Constrained Area Study*

There are three Narrow Constrained Areas (NCA) in the Midwest ISO which have been identified by the Independent Market Monitor (IMM). Stakeholders have requested that the Midwest ISO study the NCAs and develop Transmission Owner endorsed mitigation plans. MISO's energy market tariff indicates that the NCA designation may be removed if congestion on the Binding Transmission Constraints drops below 500 hours during a 12-month period. Any changes in the NCA designation must be made by the IMM, who must be satisfied that there is sufficient congestion relief. The results of the MISO NCA study will be incorporated into the final MTEP 08 report. To date, MISO has indicated that planned and proposed projects appear to mitigate the WUMS and Upper WUMS NCAs.

#### *The Regional Generation Outlet Study (RGOS)*

The Midwest ISO is looking at a new approach to address two significant changes/challenges within the MISO system. The first is the implementation of mandatory Renewable Portfolio Standards (RPSs) within several states (MN, WI, IA, IL) in the MISO footprint. Load-serving entities within those states will be required to procure a certain portion of their energy needs from renewable energy at a certain point in time. To meet the RPSs, the RGOS will examine the transmission requirements for accessing higher capacity



factor regional wind plants versus a mix of potentially lower capacity factor local wind plants. MISO has also experienced an exponential increase in generation interconnection queue requests, particularly for new wind generation in the western part of the MISO footprint. Due to the very large number of generator interconnection requests, MISO has not been able to process the majority of requests in a timely manner. MISO has attempted to alleviate this issue with modifications to its queue process, which were filed for FERC approval in June 2008.

In order to address the RPS and queue issues, MISO has implemented this study to identify potential transmission solutions. Results of the study are expected by April 2009.

#### *MTEP 09 economic study and the JCSP*

ATC Planning staff participates in the MISO MTEP 09 long-term economic study and the JCSP study. The MTEP 09 will include four economic futures. Two of the futures, the Reference and 20% Wind, are coordinated with the JCSP study. The other two MTEP 09 futures are an Environmental Future and a Limited Investment Future. The MTEP long-term economic studies typically experience a two year cycle. The MTEP 09 Study began in late 2007 and will run through 2009.

#### *Other MISO planning activities*

ATC Planning staff also participates in MISO Planning Sub-committee (PS) and Planning Advisory Committee (PAC) activities. Our involvement includes taking part in various technical and policy discussions and providing feedback concerning the future direction of MTEP activities.

#### □ **CapX2020**

The CapX 2020 utilities – an alliance of electric cooperatives, municipals and investor-owned utilities – took the first step in the regulatory approval process to build three new 345-kV transmission lines. A Certificate of Need (CON) filing for the three lines listed below; was made with the Minnesota Public Utilities Commission in 2008.

The approximate lengths and general locations of the proposed lines are as follows:

- A 200-mile, 345-kilovolt line between Brookings, S.D., and the southeast Twin Cities, plus a related 30-mile, 345-kilovolt line between Marshall, Minn., and Granite Falls, Minn.;
- A 200-mile, 345-kilovolt line between Fargo, N.D., and the St. Cloud/Monticello, Minn., area;
- A 150-mile, 345-kilovolt line between the southeast Twin Cities, Rochester, Minn., and La Crosse, Wis.

While Great River Energy and Xcel Energy are taking the lead on the three 345-kV lines,



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other utilities also will be involved in permitting, building and financing them. A fourth line – a 230-kilovolt, 70-mile line in the Bemidji area of north central Minnesota – also is among the CapX 2020 Group 1 projects.

Information about the projects and updates can be found on the CapX 2020 Web site at [www.capx2020.com](http://www.capx2020.com).

Portions of the lines also will require approvals by federal officials and by regulators in North Dakota, South Dakota and Wisconsin.

### *Continuation of the CapX Project beyond La Crosse*

In the summer of 2005, Rochester Public Utilities (RPU) and Dairyland Power Cooperative (DPC) released a draft study detailing a plan to build a 345 kV line from the Prairie Island Substation south to Rochester, MN and then east to La Crosse, WI. This study also included potential future plans to continue the line from La Crosse into the Madison, WI area.

### *Preliminary Results*

Preliminary analysis has begun to determine the potential implications of continuing this line into the Salem, IA, Madison and Eau Claire Area. Four different alternatives are currently being evaluated. They include:

- North La Crosse – Salem 345-kV line
- North La Crosse – Hilltop – Columbia 345-kV line  
Council Creek – Hilltop – Birchwood 138-kV line
- North La Crosse – Eau Claire 345-kV line
- North La Crosse – Hilltop - Spring Green – West Middleton 345-kV line  
Spring Green – West Middleton 138-kV line

At this point, the results of the analyses are inconclusive with regard to which option performs the best. Each of these options and some additional options will be studied further and in more depth to help determine which of them would likely provide the greatest customer benefit. To date, ATC has supplied feedback regarding this study. In the future, ATC will be taking a more active role performing studies and will more closely collaborate with neighboring transmission owners.