October 2009 10-Year Assessment
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Regional planning

ATC is involved in various regional planning efforts that address regional and inter-regional needs that could impact our transmission system. Particularly, there is proposed and anticipated legislation at both the national and state levels that call for significant change such as enhanced renewable portfolio standards and green-house gas emission reductions. ATC has undertaken internal analyses and participated in regional studies to anticipate future demands on the transmission system and to identify facilities that will potentially be required.

- ❑ MISO Regional Generation Outlet Study (RGOS)

  The Midwest ISO initiated the RGOS Phase I as a targeted planning study. The objective of this study is to identify a set of regionally coordinated transmission projects that interconnect and deliver new wind generation based on the Renewable Portfolio Standard (RPS) requirements in four states - Illinois, Iowa, Minnesota and Wisconsin. RGOS Phase I also is supporting the Upper Midwest Transmission Development Initiative (UMTDI). UMTDI is a collaborative effort by Wisconsin, Minnesota, Iowa, South Dakota and North Dakota to develop a transmission plan and a corresponding cost sharing methodology, particularly for facilities needed to satisfy the states' RPS.

  In May of 2009, the Midwest ISO kicked-off RGOS Phase II, which will identify the transmission alternatives needed to implement new or expanded renewable portfolio standards and other renewable goals not necessarily addressed in the RGOS Phase I study, such as RPSs in Michigan and Ohio.

  The RGOS Phase I has completed the following steps:

  1. Survey of state renewable requirements for Minnesota, Wisconsin, Iowa and Illinois utilities.
  2. Initial development of 65 wind zones of 750 megawatts each in Minnesota, Iowa, Wisconsin, Illinois, North Dakota and South Dakota.
  3. Identification of 13 wind zone configurations targeted toward moving generation to meet individual UMTDI state RPSs.
  4. Development of indicative transmission plans for the wind zone configurations.
  5. Detailed analysis on two indicative transmission plans for two configurations of 20 wind zones selected by UMTDI executive committee; analysis to be done at two wind generation levels (15 and 25 gigawatts).

  The on-going RGOS Phase I detailed study:

  The detailed study evaluates the 15- and 25-gigawatt wind generation sited in the UMTDI states and additional wind zones sited in Illinois. Since the two wind zone configurations are not significantly different from one another, detailed analyses will be performed for one scenario and the plans will be tested in the other scenario. The detailed study includes PROMOD economic, power flow and transient stability analyses. The Midwest ISO anticipates providing results to the UMTDI executive committee by the end of October 2009.

The RGOS Phase II:

RGOS Phase II considers the wind generation required to satisfy state RPSs and goals beyond those focused on in Phase I. The study will consider three main scenarios with varying locations of where wind generation is sited in the Midwest ISO footprint:

Local: In this scenario a state's renewable energy requirements and goals will generally be met with generation within the state. The UMTDI states' requirements will be met with the wind zones identified in RGOS Phase I.

Regional: In this scenario renewable energy requirements and goals will be met with resources located in renewable energy zones within Midwest ISO with the highest capacity factors, most of which will be located within the UMTDI states.

Combination: Renewable energy requirements and goals will be met with a combination of resources located within states outside of the UMTDI states and states with the highest capacity factors.

Thus far, wind zones have been finalized for Phase II of RGOS and in July 2009 a workshop was held to design indicative transmission plans for the three scenarios. Phase II of the RGOS study is expected to be completed by first quarter of 2010.

- Midwest ISO Market Constraints

  There are three Narrow Constrained Areas (NCAs) identified in the Midwest ISO footprint and two of them are associated with ATC. An NCA is defined as "An electrical area that has been identified by the Independent Market Monitor (IMM) that is defined by one or more Binding Transmission Constraints that are expected to be binding for at least five hundred (500) hours during a given year within which one or more suppliers are pivotal."[1]. The two NCAs associated with ATC are Wisconsin and Upper Michigan System (WUMS) and Northern WUMS.

  During the Midwest ISO's 2008 transmission expansion planning process, a targeted study was performed to determine if NCAs are mitigated by existing plans. Results demonstrated that the two NCAs associated with ATC's footprint are mitigated by the existing transmission plans already approved by the MISO Board of Directors to be included in Appendix A of the MISO Transmission Expansion Plan (MTEP). The Technical Review Group for this targeted study recommended that these findings should be forwarded to the Independent Market Monitor. After the identified upgrades are constructed, a formal request to remove the NCAs will be made to the Independent Market Monitor.

  Generation Deliverability **–** 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 Midwest ISO. This deliverability analysis is performed as part of the generator-transmission interconnection process.

[1] Excerpt from Midwest ISO Transmission Expansion Plan 2008, Section 8.

- Midwest ISO Planning Process

  The MTEP process has adopted an approach that investigates transmission expansions for the long term, short term and for targeted issues/needs. The Midwest ISO footprint is divided into three sub-regions for planning purposes: western, central and eastern. The ATC footprint falls within the western sub-region. The long-term studies are primarily value-based economic studies looking into the ten- to twenty-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- to ten-year horizon and is thus far primarily driven by Transmission Owners' reliability needs and compliance with NERC reliability standards. To date, the projects that address short-term reliability needs have been proposed to the Midwest ISO 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 thus far follow a two-year planning cycle.

  Midwest ISO Transmission Expansion Plan 2009 (MTEP 09) reliability studies

  The ATC Planning staff participates in the Midwest ISO MTEP 09 bottom-up reliability studies to ensure correct representation of the our projects. These activities involve:

  - Including ATC project information in the Midwest ISO project database,
  - Participating in building/reviewing the MTEP models,
  - Correlating the needs identified in the Midwest ISO analyses with the specific ATC projects,
  - Reviewing and commenting on MTEP study results to ensure successful inclusion of the ATC projects in MTEP Appendix A in a timely manner,
  - Ensuring the appropriate cost allocation for those ATC projects eligible for regional cost sharing,
  - Answering questions related to ATC projects at the western Sub-region Planning Meetings (SPM) and other stakeholder forums, and
  - Provide suggestions/comments that help improve the MTEP process.

  MISO Transmission Expansion Plan 2009 (MTEP 09) targeted studies

  As we've done with the RGOS study, ATC Planning staff has participated in other targeted studies in the MTEP 09 cycle, including but not limited to the Midwest ISO's top constraints study. This study identifies the top constraints in the MISO footprint based on operational historical information and PROMOD economic analysis. The study also will identify projects or portfolios of projects that relieve the constraints and test if the mitigation plans meet criteria for regional cost sharing.

  MTEP 09 economic study and the Joint Coordinated System Plan (JCSP) study

  ATC Planning staff participates in the MISO MTEP 09 long-term economic and the Joint Coordinated System Plan studies:

  - The MTEP 09 economic study evaluates four future plausible generation development scenarios. The study began in late 2007 and will run through 2009.

- The JCSP study is a joint effort among several regional entities including the Midwest ISO, PJM, SPP, TVA and MAPP. The study began during the last quarter of 2007, and the final report was issued during the first quarter of 2009.

  Conceptual transmission overlays were identified for two future generation development scenarios – the Reference scenario and the 20% Wind scenario (for the U.S. footprint in the eastern interconnection excluding Florida). It is unclear whether the JCSP study effort will continue or when the next study cycle will begin. More information about the JCSP study is located at: http://www.jscpstudy.org.

Other Midwest ISO planning activities
Our Planning staff also participates in other Midwest ISO planning activities such as the Planning Sub-committee and Planning Advisory Committee. Our involvement includes taking part in various technical and policy discussions and providing feedback concerning the future direction of MTEP activities. ATC also actively participates in other groups including, but not limited to the Midwest ISO Interconnection Process Task Force and observes closely several generation interconnection System Planning Analysis and Definitive Planning Phase group studies.

- Western Wisconsin Study
  ATC is currently leading a joint study effort investigating the long-term reliability issues and transmission needs in the western Wisconsin area, collaborating with the transmission-owning utilities Xcel Energy, Dairyland Power Cooperative, ITC Midwest, Great River Energy, Southern Minnesota Municipal Power Agency and the Midwest ISO. The western Wisconsin area is often impacted by various through flows, e.g., the west to east flow bias, which can stress the area's transmission network. Increasing wind penetration levels in the west contribute to increased flows (in terms of magnitude and frequency) through the western Wisconsin area in real-time system operations.

  This emerging reliability concern can become more significant when additional wind generation comes online in future years in the west. The Minnesota-Wisconsin Export interface is currently limited due to voltage stability and transient voltage recovery constraints. Transmission reinforcement in the study area is likely to have a significant positive impact on this critical interface. Local reliability issues and transmission needs will also be evaluated in an integrated fashion in conjunction with the regional flow bias issues.

  The joint study group has completed development of a set of 2018 summer peak and off-peak models with assistance from the Midwest ISO in creating the Midwest ISO footprint Security Constrained Economic Dispatch for the study models and power flow AC contingency analysis is underway. The transmission options that are being evaluated include, but are not limited to the following:

  - North La Crosse – Spring Green – Cardinal 345-kV project
  - North La Crosse – Lore 345-kV project
  - North La Crosse – Eau Claire 345-kV project

- ❑ North La Crosse – Spring Green – Cardinal 345-kV and Lore – Spring Green – Cardinal 345-kV project
- ❑ North La Crosse – Lore 345-kV and North Cassville – Spring Green – Cardinal 345-kV project
- ❑ Genoa – North Monroe 765-kV project and,
- ❑ A lower voltage (138-kV and/or 161-kV) alternative

ATC is planning on additional engagement with our customers and other stakeholders for comments and input for this study.

- ❑ Eastern Interconnection Planning Collaborative
  ATC is among the NERC-registered Planning Authorities in the Eastern Interconnection that are in the process of forming the "Eastern Interconnection Planning Collaborative" (EIPC). The EIPC consists of a group of 23 Planning Authorities, working with the Department of Energy, formed to develop conceptual Eastern Interconnection-wide transmission plans. ATC has been an active participant in the EIPC, which has submitted a bid to perform eastern interconnection-wide planning in response to a DOE funding opportunity. The DOE's proposal selection is expected by early November 2009, and a final contract is expected by the end of 2009.

- ❑ Regional Transmission Assessments
  ATC is a member of two regional reliability organizations, the Midwest Reliability Organization (MRO) and the Reliability*First* Corporation (RFC). ATC participates in regional transmission assessments conducted by the MRO Transmission Assessment Subcommittee (TAS), and the RFC Transmission Performance Subcommittee (TPS). ATC also participates in the Coordinated Seasonal Assessments (CSA) conducted by MISO.

- ❑ La Crosse-Madison 345-kilovolt line
  We continue with efforts begun in 2008 to work with stakeholders in identifying projects that provide economic benefits and upgrades that could improve access to lower-cost sources of power inside and outside our service territory. Stakeholders continue to express significant interest in a high-voltage line between La Crosse and Madison; it also is believed that the line would support the Upper Midwest Transmission Development Initiative to meet renewable portfolio standards in the region.