About Section

Planning Approach

Our approach to transmission planning is built upon two critical foundations – comprehensive engineering analyses and collaborative communications.

We are continually assessing and reassessing the needs of existing and anticipated system users, on both an individual and collective basis, according to accepted industry system performance criteria and practices. Our goal is to initially determine, and then evolve over time, the best set of transmission projects to address those needs. "Best" means striking the right balance among reliability, risk, cost and societal impact so that the resulting plan is publicly acceptable and constructible.

We evaluate transmission need drivers, including load growth forecasts and proposed new power plants, and use computer models to analyze problems and implications and identify potential solutions. We strive to design a portfolio of projects where each project addresses multiple needs, so that the set of needs in total can be met as efficiently as possible, and overall societal impacts can thus be minimized.

We work closely with the Midwest Independent System Operator (MISO) to integrate our local transmission planning and operating activities with those occurring on a regional and national basis. We also actively participate in regional planning forums and incorporate regional need drivers and implications of adjacent utilities' activities into our local plans. We monitor industry developments, follow potential national energy legislation, and incorporate new tools, standards and practices into our planning approach as appropriate.

ATC is developing additional processes to enhance the development of future 10-Year Assessments. As part the traditional Assessment process, we will be adding steps of communication with stakeholders regarding our assumptions prior to engaging in studies. These communications may consist of meetings with stakeholders to discuss possible futures and drivers for these futures and/or realistic goals for Assessment studies. We expect to follow up with customers about needs being found to enhance potential solutions. Ultimately, we would utilize all information gathered to propose the next set of 10-year projects for ATC.

In addition to reliability-based projects, ATC has started to engage stakeholders with regard to identification of the most important economic benefit projects. This process also uses pre-analysis stakeholder input and is described more thoroughly in the Economic Analysis section of this document.

Our annual 10-Year Transmission System Assessment report is an important planning communication tool – presenting up-to-date results of our ongoing engineering analyses,

including information on the array of needs driving system upgrades and the potential projects anticipated to best meet those needs. The report provides the baseline information necessary to facilitate future communications with and involvement by anyone interested in engaging further in either the general planning process or the subsequent, more specific and locally focused, routing and siting process for individual projects.

This analysis is iterative by nature, as situations can change at any time. We want to be able to take new information into account as quickly as possible and adjust our plans accordingly. We only will build transmission in response to specific identified needs – if the needs change or disappear, so do the corresponding transmission projects.

For more about ATC's public outreach and siting process, go to Routing & Siting.

Public Participation Section

Open Letter from ATC's Planning Director

Evaluating electric system needs and their possible solutions and selecting plans for eventual proposals are important processes. From our company's inception we have shared our plans publicly and invited stakeholder comments by annually issuing our 10-Year Transmission System Assessment. Now the Federal Energy Regulatory Commission has required transmission owning utilities like ATC to make planning *processes* open and transparent as well. You will find below an overview of the required underlying principles of a sound planning process and the major categories of electric system planning performed by ATC, along with links to contact information, procedures, and upcoming public planning meetings.

We welcome your input as a participant in our ongoing economic studies, our upcoming 10-Year Assessment planning process or in specific planning analyses designed for particular parts of our system.

Transmission line projects serve both local and regional needs, and successful planning and siting of transmission lines that bring electricity into communities depends on local participation. We appreciate your input and encourage you to review our current plans and participate in the development of upcoming plans.

Sincerely,

Flora Flygt
Director of Planning

Principles of Open Planning

The Federal Energy Regulatory Commission requires transmission-owning companies like ATC to ensure that its planning processes embody nine principles, which are briefly summarized below. The term "customers" as it is used below refers to local utilities that take high voltage power from ATC's transmission system and distribute it to consumers.

Coordination
Transmission providers must meet with all of their transmission customers and interconnected neighbors to develop a transmission plan on a nondiscriminatory basis. The planning process must provide for the timely and meaningful input and participation of customers.

Openness
The planning process must be open to all interested parties and must include safeguards to ensure confidentiality of transmission system information, particularly Critical Energy Infrastructure Information (“CEII”).

Transparency
Transmission providers and transmission owners are to disclose basic planning criteria, planning assumptions and planning data along with study methodologies, criteria, and processes and disclose underlying information.

Information exchange
Transmission Providers, in consultation with customers and other stakeholders, must develop information exchange guidelines and schedules for submittal of information from both network and point-to-point transmission customers.

Comparability
Each Transmission Provider is to develop a transmission plan that (1) meets the specific service requests of its transmission customers; and (2) otherwise treats similarly situated customers comparably in transmission system planning.

Dispute resolution
For transmission planning-related issues, Transmission Providers must have a dispute mechanism which is able to address both procedural and substantive technical engineering and planning issues.

Regional participation
Each Transmission Provider is required to coordinate with interconnected utilities to: (1) share system plans to ensure that they are simultaneously feasible and otherwise use consistent assumptions and data; and (2) identify system enhancements that could relieve

congestion or integrate new resources. The coordinated regional planning must be open and inclusive and address both reliability and economic considerations.

Economic planning studies
Transmission Providers are required to perform economic planning studies (1) to address both "local" congestion and congestion between control areas and sub-regions and (2) to integrate new generation resources and/or loads on an aggregated or regional basis.

Cost allocation
The transmission Provider's planning process must address the allocation of costs of new facilities. This applies only to regional projects that do not fit under existing rate structures, such as regional projects involving several transmission owners or economic projects that are identified under the study process described under the economic planning studies principle. The planning proposal should identify the types of new projects that are not covered under existing cost allocation rules.

Seven Categories of Planning
Network Adequacy planning
The planning process that encompasses the largest share of our projects is Network Adequacy Planning. It's an overall assessment of our system and its ability to handle growth and changes in electricity consumption and deliver power under changing system conditions in the future. We simulate future conditions, examine weaknesses and model a variety of potential solutions using our publicly posted planning criteria..

Economic Project planning
Economic Project planning refers to studies that look for transmission system congestion that has a significant adverse impact on the delivered cost of energy to consumers. We use historical data and future flow forecasts in our models to help identify potential ways to mitigate or relieve those effects. ATC has developed a process to identify projects with the greatest opportunity to provide economic benefits. We have been engaged with statewide stakeholders for the past several years through our Access Initiative, and have developed economic planning processes to continue to perform studies in consultation with our stakeholders.

Distribution to Transmission Interconnection planning
D-T Interconnections Planning examines ways the transmission system may need to be enhanced or expanded to interconnect new electric substations that are proposed to support local growth. When business or housing developments are built in areas that previously were rural, the electric system must be expanded to supply new power needs. When local utilities' expansion plans require new interconnections with the transmission system, utilities must submit a load interconnection request form. The load interconnection business practice outlines how we work with utilities to devise the most cost-effective solution and we maintain an interconnection queue to help facilitate communication with utilities about these requests.

Transmission to Transmission Interconnection planning
T-T Interconnection Planning examines the impact on our system of transmission expansions to, from and adjacent to our service area. We coordinate our assessments of the need for new facilities with the plans for adjacent transmission systems to identify a wider variety of options on a cooperative basis.

Generator to Transmission Interconnection planning
G-T Interconnections Planning studies the impacts that additions or changes in electricity generation output have on the transmission system. These impacts often require modifications or expansions of transmission facilities. Requests for interconnection studies of the transmission system must be sent to the Midwest Independent System Operator. We work collaboratively with the Midwest ISO on these studies and also offer supplemental

interconnection guidelines for generators wishing to connect new facilities to our transmission system.

Transmission Service planning
Transmission Service Planning refers to transmission system studies that are required to resolve future delivery issues. A utility's purchase of power request is made to the Midwest ISO. The Midwest ISO and ATC determine if there is adequate "available transmission capacity" to accommodate the power purchase. If not, then the studies recommend solutions to deliver the power as requested.

Regional planning

Regional planning refers to ATC's planning coordination activities at a regional level. ATC provides its transmission plans to MISO for inclusion in the regional plan or MTEP. ATC and MISO collaborate on the projects to facilitate MISO's review of the projects. MISO reviews the transmission projects submitted by ATC to ensure they do not provide an adverse affect on transfer capability, do not adversely affect the availability over the transmission facilities which MISO has control and to determine if they could be combined with transmission projects from other transmission owners to develop less costly or more cost-effective alternatives.

ATC also meets with adjacent transmission owners to coordinate planning on a single-system basis in an effort to develop transmission solutions that resolve multiple system reliability and capacity requirements at the lowest reasonable cost.

Planning Criteria & Tools

Planning criteria
We employ various system planning criteria to ensure that we develop a reliable and robust transmission system. Our aim with these criteria is to support effective competition in energy markets, to reliably deliver power to systems connected to our system and customers dependent on our system, to provide support to distribution systems interconnected to our system and to deliver energy from existing and new generation facilities connected to our system.

These criteria may be revised from time to time. Situations that could precipitate such a change could include, but are not limited to new system conditions, new technologies, new operating procedures, extraordinary events, safety issues, operational issues, maintenance issues, customer requests, regulatory requirements and reliability council or NERC requirements.

The planning criteria are listed under the following headings:

- System Performance Criteria
- Capacity Benefit Margin Criteria
- Transmission Reserve Margin Criteria
- Facility Rating Criteria
- Model Building Criteria
- Facility Condition Criteria
- Planning Zones
- System Alternatives
- Load Forecast Criteria
- Economic Criteria
- Environmental Criteria
- Other Considerations

Planning tools
Our planning engineers use the following computer applications to simulate the impact of potential future events on the transmission system. The same applications are used to determine how proposed solutions would address any identified adverse impacts.

- **Ventyx PROMOD** - predicts the cost of producing energy to serve customers
- **Burchett Inc**. PROMOD Analysis Tool (PAT) – post-processing analytic capability for PROMOD results
- **General Electric MARS** - determines "Loss of Load Expectation", a measure of the ability of system resources to meet customer demand
- **Siemens (PTI) MUST** - calculates the capability of the system to transfer power from one area to another while respecting thermal limitations
- **Siemens (PTI) PSS/E** - calculates static and dynamic power flows
- **Electrotek Concepts Superharm** - calculates harmonics
- **PowerTech VSAT/TSAT/PSAT** - calculates the capability of the system to transfer power from one area to another while respecting voltage limitations
- **Power World Corp PowerWorld** - calculates static power flows with a visual interface
- **V&R Energy Systems Research POM/OPM** - determines "Expected Unserved Energy", a measure of the ability of the system to deliver resources to meet customer demand.

Technical Documents

Utilities and generators that seek to interconnect new equipment with our transmission system must complete requests for information. To accurately analyze sytem needs, we also need significant data on electricity use and power flows from local utilities.

Transmission to Distribution Interconnection Agreement
This agreement pertains to local distribution utilities and the interconnection of their lower voltage distribution systems with the higher voltage transmission grid.

Load Forecasting Process
ATC requests historical and forecasted electricity demand (referred to as "load") information from local utilities each year for long-range planning purposes. The data analysis process and load forecasting worksheets outline the kind of information our planning engineers must analyze. We also work closely with local utility planners to coordinate the technical analysis. ATC performs an independent review of the forecasts and works with customers to reach consensus regarding forecast assumptions. When needed for particular analyses, ATC develops ranges of load forecasts. The ranges are developed in consultation with stakeholders.

Transmission to Transmission Interconnection Study Procedure
Transmission owners and operators in adjacent systems work with ATC on a joint assessment of future system conditions and needs.

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