Principles for Efficient and Reliable Reactive Power Supply and Consumption

Docket No. AD05-1-000

March 8, 2005

Prepared Remarks of:
Harry L. Terhune
Vice President - Operations
American Transmission Company LLC

on behalf of

The Midwest Stand-Alone Transmission Companies

Good afternoon and thank you for inviting me to speak at today's conference. My name is Harry Terhune. I am Vice President - Operations of American Transmission Company LLC ("ATCLLC"). I am appearing today on behalf of the Midwest Stand-Alone Transmission Companies, otherwise known as the "MSATs," a group consisting of ATCLLC, GridAmerica LLC, International Transmission Company, and Michigan Electric Transmission Company, LLC.

The MSATs are FERC-regulated transmission companies whose sole purpose is to invest in, own, plan, construct, operate, maintain and/or manage transmission facilities. We do not own generation, buy or sell energy, or serve retail customers within the Midwest Independent Transmission System Operator (MISO) RTO region. The

MSATs typically do not receive or pay for generator-supplied reactive power compensation, but recognize that generator-supplied reactive power is a large part of the overall mix of reactive resources that is critically needed for reliable and efficient operation of the transmission grid.

We recognize that the management of reactive power is fundamental to power system reliability. Ensuring that the appropriate amount of reactive support required to maintain system voltage levels is available is an integral part of normal power system planning and operations.

Reactive power affects system-wide performance in terms of reliability criteria and power transfer levels. However, due to physical system characteristics, it cannot be supplied efficiently at long distance. Because of this, it is imperative to ensure a geographically and electrically dispersed distribution of reactive resources.

The provision of these requirements can be met through a variety of devices at the generation, transmission, and distribution system level. First and foremost, inductance and capacitance occur naturally in the physical elements, such as transmission lines and transformers that make up the power system. It is imperative that the reactive power requirements over and above those which occur naturally are provided by an appropriate combination of dynamic and static devices. Dynamic devices include synchronous generators, Flexible AC Transmission Systems (FACTS), dynamic Vars (D-Vars) and to a lesser extent synchronous condensers, while static devices include capacitors and reactors. Static devices typically have lower capital costs than dynamic devices, and from a system point of view, they are used to provide normal or intact-system voltage support and to adapt to slowly changing conditions,

such as daily load cycles and scheduled transactions. By contrast, dynamic reactive power sources must be deployed to allow the transmission system to respond to rapidly changing conditions on the transmission system, such as sudden loss of generators or transmission facilities. An appropriate combination of both static and dynamic resources is needed to ensure reliable operation of the transmission system at an appropriate level of costs.

Financial compensation for generator-supplied reactive power should be comparable and equitable for those generators that supply comparable voltage support services regardless of ownership within a particular region. This methodology should accommodate existing reactive support arrangements.

The Commission should consider the following principles regarding reactive power:

1) Insufficient reactive power capability has been a major or critical factor in many regional blackouts. Because of the importance of reactive support for reliability and operability of the transmission system, the local nature of reactive support, and the need for an appropriate mix of different types of reactive resources that are not readily interchangeable, reactive power is not conducive to trading in a competitive regional market and is inherently prone to local market power concerns. Equally, reactive power should not be permitted to be withheld by a reactive resource owner/operator seeking a certain price. Reactive power, therefore, may be best treated as a regulatory requirement recognizing that different requirements may exist for different types of reactive resources under different regulatory regimes.

2) From a pragmatic standpoint, the costs associated with moving toward a real–time reactive power market are likely to outweigh any consumer benefits that might be derived from such a market. For one thing, the revenue quality metering that is required for such a market does not exist, and virtually all existing metering would need to be changed out before any such market could develop. Moreover, because reactive costs are small compared to real power costs, there is likely little relative value in co-optimization. Accordingly, it is more important to make sure that insufficient reactive capability does not result in reliability problems or inefficiencies in the real power market.

3) Centralized control of, and planning for, reactive supply from both dynamic and static devices is a function that should be performed in accordance with the relevant reliability standards and criteria (FERC, NERC, Regional and local requirements). Although there are multiple forms of reactive support, different reactive resources provide different benefits, depending upon system conditions and the location and nature of the sources. Any policies for generation-based reactive resources should not interfere with the planning of non-generation resources required for reactive support of transmission or distribution infrastructure.

4) Since reactive power requirements are dependent on constantly changing system conditions (such as load cycles, generation active power dispatch and system planned and unplanned outages) voltage and hence reactive management is better determined on a regional basis through a coordinated planning process. Such coordinated regional planning should recognize the planning responsibilities appropriately delegated to Stand-Alone Transmission Companies.

5) Generators should be eligible for compensation for their reactive support required to maintain system voltages under a range of system conditions both inside and outside of the power factor range required in their interconnection agreements.

   a) There is an innate requirement for generators to supply/absorb reactive power to ensure their own steady state and transient stability and to ensure adequate voltage for generator auxiliaries to stay on line. The power factor “range” under discussion should represent that essential requirement. MSATs support comparable compensation within the “range”.

      i) Such compensation for dynamic reactive support should, in general, be to ensure the availability of reactive capability, rather than a Mvar commodity quantity usage payment, to ensure that planned reactive capability is available when and where required.

      ii) Generators must provide reactive capability when called upon, and in doing so should be appropriately compensated for additional costs, e.g. startup, lost opportunity costs, etc.

   b) The transmission system requires reactive power to maintain voltage and stability under normal and emergency conditions and to offset reactive power losses within the transmission system. Planners seek solutions which help to reduce the delivered cost of energy by including an appropriate selection of reactive power resources including capacitors and reactors as well as dynamic devices such as static var compensators and other non-rotating devices and, principally, the reactive capabilities of generators. The reactive capability of generation resources outside the “range” is typically the primary source of the reactive power called upon to

deal with rapidly changing conditions due to emergencies. It is appropriate to provide compensation for this capability as needed, in a comparable manner amongst generators regardless of ownership.

6) All generators must be subject to enhanced operating authority of the system operator:

   a) The system operator should have authority to instruct a generator to provide reactive support even if it is not otherwise operating.

   b) Generators should be subject to periodic testing to ensure they maintain the required reactive capability.

   c) System operators should incorporate into their operating protocols the use of reactive power to relieve congestion.

   d) Generators operating outside of the direction of the system operator should be subject to loss of reactive power payments or such other penalties that may be prescribed in approved tariffs or market rules.

7) Transmission devices for reactive support, generally provided by the transmission system owner, should be compensated through the transmission provider's transmission rates. For traditionally FERC-regulated transmission providers, such rates would be calculated using traditional cost of service or, at the transmission owner's option, in Commission-approved performance-based rates.

* * *

Again, I would like to thank the Commission for providing the MSATs with the opportunity to participate in today's conference and I look forward to answering any questions you may have.