

Points of Discussions

Network Capacity Impact on Competitive Market Operation

Experts Group Meeting on 19-02-2010

A copy of the paper titled “Transmission Network Performance in Competitive Electricity Market, Network Stability and consumer Confidence in competitive markets, and Electricity Trading in Competitive market ” are enclosed for perusal of the participants.

Network management tools helps automate, simplify, and integrate network to reduce operational costs and improve productivity. Ensure the effective delivery of applications and services in complex IT environments.

Net work planning helps predict the impact of changes to network’s topology, configuration, traffic, and technology. The off-line tools modeling tools builds a model of the production network and validated proposed network changes against policies prior to deployment.

The power utilities have to be alert to the very fast changing pattern of the load and needs a close watch of the parameters that affect the load.

Keeping the above in view, the participants may discuss the importance of the following aspects:

- **Network Pricing**
- **Infrastructure Development**
- **Risk Management**
 - a. **Investment**
 - b. **reliability**
 - c. **performance**
- **Regulatory Issues**
- **Market Structure & Design (specially inter- region)**

AGENDA NOTE/PAPER

Network Capacity Impact on Competitive Market Operation

Date of meeting 19 -02-2010

Access to reliable and affordable electricity is a key determinant of economic growth and community prosperity. To meet the demand for electrical energy effectively, it is necessary to predict the electricity consumption and to plan for the necessary development in the electricity production and transmission network.

Effective performance of transmission network will help to develop an efficient electricity market particularly the emerging inter-region trading of electricity market.

Potential advantage of an efficient transmission may include;

- i. Efficient development of inter-regional trade which may
 - Increase effective competition
 - Reduce scope of market power abuse.
- ii. Improve capacity utilization (both generation and network) and deferral the investment in generating capacity.
 - a. And cost effective strengthening of system reliability through more effective reserve capacity sharing arrangement.

Electricity market reforms and more effective regulation of transmission network have brought unbundling and independent, decentralized decision making utilities. This produces number of independent market participants utilizing the transmission network. The independent decentralized decision making utilities has fundamentally changed the utilization of transmission networks. **Relatively stable and predictable network has been replaced with less predictable usage, greater volatility, long distance transportation indicating the inter-region trading.** There has been significant development of green energy generation technologies with stringent environmental regulations and intermittent generation, making the operation of transmission network increasingly complex, prone to congestion and expensive.

All these factors have created new challenges for maintaining reliable & efficient transmission network. An energy company's increased dependence on the network for instantaneous updates regarding the production and delivery of resources to their customers and for sharing information across a widely distributed network of plant facilities, data centers, repair offices, and billing locations.

NETWORK MANAGEMENT & PLANNING.

Transmission network planning may be warranted to make it more compatible with new market and regulatory reforms. Network management tools helps automate, simplify, and integrate network to reduce operational costs and improve productivity. In this more integrated and volatile operating environment, an event affecting a part of integrated transmission network may

have greater potential to interrupt the delivery of electricity through out an interconnected network.

Net work planning helps to balance the supply and demand at any point with in an interconnected transmission network to ensure reliable supply that meets defined voltage and frequency requirement. Network planning may be warranted to make it more compatible with new market and regulatory arrangement especially between network owner/operators within large regional market, to ensure more holistic and regionally integrated perspective.

NETWORK INVESTMENT

Electricity reforms, unbundling of electricity board has exposed the financial risk and return characteristics in network infrastructure. Electricity reforms also create new challenges in relation to effectively coordinating transmission network development with new investment affecting generation or load pattern.

Development of transmission capacity on interconnectors between states to support integrated reliable regional electricity market and to reinforce to existing network is very uncertain and risky.

Where there are many transmission network operators within a regional market, it is likely that any one of them have clear incentive to undertake transmission network development as compare to others.

Shared or unclear ownership responsibilities combined with practical challenges of coordinating investments between different network owners, have the potential to weaken incentive and increase risk, particularly for interconnector investment.

It is matter of concern about underinvestment in transmission network infrastructure. Whether this is due to electricity reforms or regulatory mechanism .Investment in network has become an important policy issue for power utilities.

MITIGATION POLICY

Electricity reforms /restructuring require open access to the transmission essential facility. The scope of transmission constraints could substantially determine the degree of market power and the necessity for further mitigation or regulation. Constraints on the transmission system may be greater during off-peak periods when not all the plants are running and there is an economic incentive to use transmission to reach distant plants. Furthermore, when the complex transmission interactions are considered, the topology of the market will be driven by electrical distance not geographical distance . Electric transmission network can be large and important.

- Conventional definitions of network interface transfer capacity depend on the assumed load conditions.
- Transfer capacity cannot be defined or guaranteed over any reasonable horizon

Transmission grid illustrates some of the special conditions that may arise due to network interactions. Supply and demand equilibrium, with all participants acting as price taking participants, provides a competitive benchmark. The interaction through the network makes it

profitable to operate some generation at a loss, increasing generation above the competitive benchmark, and benefitting from the effect of partially blocking a transmission constraint. The essential, unusual element in the transmission network that create strong interactions between the participants who may have market power. The real electricity network may have this form of leverage.

CHALLENGE

Electricity reforms have generally led to increased network use and greater volatile of usage, the growth of inter- regional trade and the development of regional electricity market. Attention is focused on reliability of electricity.

The need for greater co-ordination and communication between system operators within the regional market and inter-regional market. Implementation of uniform operating standard and emergency procedures.

Improvement in system operation includes the need for appropriate real-time management tool, appropriately qualified staff trained to manage crisis situation and effective management of vegetation around transmission lines.

Managing the interaction between application and the network, and maintaining the high application performance under all circumstances/ conditions/ environment and deploying new application and services without disrupting existing.

Issues need to be addressed for efficient transmission network with competitive electricity market

- **Network Pricing**
- **Infrastructure Development**
- **Risk Management (Investment, reliability, performance)**
- **Regulatory issues**
- **Market Structure & Design (specially inter- region)**