

## **Enhanced Integrated Transmission & Capacity Construct (EITCC)**

The EITCC is designed to satisfy PJM's reliability requirements at a reasonable cost. The supporters offer this model as a solution to concerns regarding future long-term reliability in PJM. The model is designed to maintain resource adequacy and enhance reliability while facilitating the transformation of the electric transmission grid to support competitive wholesale energy markets. The EITCC provides an incremental and market-oriented change to PJM's existing capacity construct.

This model is not offered as a solution to the load deliverability limits that have been identified in New Jersey. In fact, only short-term RMR contracts and local transmission reinforcements will relieve those problems. A broadly applicable model designed to ensure future reliability should not be applied to the current New Jersey problem. Rather than designing the EITCC to address the situation in New Jersey, the model focuses on preventing a similar problem from occurring in the future.

This model has three fundamental parts. *First*, it supports reliability through a reasonably priced capacity market with voluntary commitments well ahead of planning years and strong incentives for commitment by load. *Second*, it recognizes locational capacity requirements to ensure that reliability criteria are satisfied in areas where local resources are limited and capacity transfer over the transmission system is also constrained. *Third*, it changes the PJM Regional Transmission Expansion Plan (RTEP) in order to: (1) make planning more sensitive to the risks that generation plants will retire; (2) incorporate longer lead times needed for major transmission system upgrades; and (3) be more comprehensive to consistently address local issues between a transmission owner and an LSE. The attached Appendix reflects a comparison between the existing PJM capacity construct and the EITCC as discussed at the Capacity Market Modifications Working Group on June 9, 2005.

### **Emphasizing Market Mechanisms within the Capacity Adequacy System**

The EITCC design is a forward obligation based on a reserve margin that is fixed three years ahead of the one-year commitment period. The voluntary commitment is based on bilateral contracts bolstered by periodic PJM-administered capacity auctions. While the commitment is voluntary, compliance is encouraged with both a carrot and a stick. Specifically, fully-committed resources will be eligible to share in capacity deficiency revenues. LSEs that do not acquire all required capacity and generators that fail to commit into the capacity market do not share in capacity deficiency revenues. Any LSE that fails to obtain all of its capacity requirements is exposed to a high capacity deficiency penalty. Combined, these two features – encouraging commitment and punishing a failure to acquire capacity – create onerous consequences of failing to commit to supply or take capacity. Most importantly, prices in the general market are set through an auction process and not administratively.

The specification of reserve requirements – the IRM - for the third year forward permits market participants to flexibly arrange for needed capacity while informing potential resource developers about anticipated market conditions generally and in constrained areas. This approach gives ample time for bilateral contracts to be structured. Surplus conditions will work in favor of purchasers. Conversely, prices reflecting supply shortages, or the failure of capacity resources to offer earlier in the process, will be seen well in advance of the commitment year. Developers of new resources will thus see supply conditions well in advance of a given planning year and can observe as these conditions evolve from year to year in relation to several future planning years. This perspective permits developers to better analyze potential generation profits.

Demand response is provided by market participants whose primary business is not providing capacity resources. Each company that may provide demand response will have its own business conditions that dictate the value of providing demand response compared to the value of continuing its core business. Thus, the EITCC permits each demand resource to offer in at points that are consistent with its primary line of business. Thus, demand, like supply, will be able to evaluate its strategies over time rather than being forced to commit far in advance of the planning year.

Each LSE's capacity requirement applies to the full planning year and may be acquired in two ways. First, market participants will have the flexibility to arrange for capacity voluntarily through bilateral contracts that are consistent with the needs of sellers and buyers. These contracts may take many forms, including forward contracts covering a number of years, and are informed by PJM's IRM, local capacity requirements and the previous period auction results. This emphasizes the market mechanism that is central to the EITCC. Second, capacity or capacity equivalents, namely demand response, can also be acquired through a variety of voluntary and mandatory auctions as described below. The timing of auctions is designed to maximize opportunities for market participants to sell or secure capacity.

The EITCC envisions PJM conducting voluntary planning year auctions on a quarterly basis over the four years preceding the planning year. This extended period for auctions, beginning even before reserve requirements are set for a given planning year, affords buyers and sellers the largest variety of options. In the final two quarterly auctions preceding the planning year, PJM will include the ability for participants to combine partial year positions into full planning year resources. This variety of approaches will encourage the development of secondary products so that market liquidity is enhanced. PJM will also implement a Final Clearing Auction (FCA) two months prior to the planning year and after all voluntary auctions are concluded. This auction will be mandatory for market participants who are short capacity (either resources or load) for the upcoming planning year and voluntary for all others. Precise capacity requirements will be established immediately prior to the final commitment auction with

the setting of final EFORD amounts and load levels. At that point, all capacity obligations must be satisfied. Any unfilled requirements must be purchased at the FCA clearing price. That price reflects capacity market conditions and may range up to and include the capacity deficiency rate (CDR). The FCA clearing price is also the basis for transfers of capacity during each planning year that are needed to accommodate retail load that shifts between LSEs. This will enable market participants to better manage the risk of load shifts.

The EITCC model strives to encourage resource flexibility in capacity markets. In addition to traditional generation resources, demand response and merchant transmission may be used to satisfy requirements. A recent study found that demand responders are severely constrained in their ability to commit far in advance of a planning year. The EITCC's use of a long period of voluntary auctions and parallel bilateral contracting opportunities makes it possible for each potential demand responder to commit as a capacity resource in a way that best fits its business conditions. Also, LSEs in Local Market Areas (LMAs) may secure external capacity that is based on firm service from merchant transmission. The ability of merchant transmission to provide additional capacity deliverability into an LMA reduces the obstacles that have prevented merchant transmission from successfully developing projects that directly meet the needs of LSEs and their customers.

Under the EITCC, LSEs will be able to acquire total requirements based on contracts of varying lengths. A variety of full year contracts can be secured over the entire four years prior to the planning year. Participants may also acquire a variety of part-year commitments. This permits new resources that cannot begin commercial operation by the beginning of a planning year to secure capacity revenues for the portion of the year following start-up. The annual obligation can be satisfied from any appropriate set of part-year and full-year contracts or from within multi-year contracts. These portfolios will be aggregated by PJM to ensure that all obligations are covered. The only limitation is that each LSE must have the full year's capacity requirement in hand at the conclusion of the FCA. Committed resources that fail to perform, including new resources that fail to come on line by the contracted start date, as well as LSEs who fail to cover their obligation, will pay the capacity deficiency rate for the entire planning year.

The incentives for buyers and sellers to finalize capacity requirements prior to the beginning of the planning year are in penalties and potential rewards. Deficiency penalties, set at the gross cost of new peaking capacity, will apply across the entire planning year rather than an interval as today. Any participant short going into the FCA must offer to buy at the capacity deficiency rate. In contrast, sellers that supply capacity to the market and clear will directly receive revenues as well as share in capacity deficiency revenues.

The EITCC's capacity market approach encourages flexible acquisition of required capacity while providing a strong incentive for obligations to be resolved prior to the final auction that is operated by PJM. Market monitoring review of participant behavior identifies price manipulation by both sellers and buyers. Where transmission solutions are not feasible, it resolves those risks by providing a reasonably priced capacity acquisition solution.

### ***Satisfying Locational Requirements***

The EITCC seeks to support reliability as the fundamental value for all PJM consumers. PJM recently reported that its latest load deliverability analysis shows that some areas in PJM are expected to fail some reliability criteria by 2008. The design of the EITCC focuses on preventing similar problems in the future. To the extent that the enhanced planning system fails to eliminate load deliverability issues, the EITCC responds by establishing required local capacity commitments in Local Market Areas (LMA).

LMAs are defined by several logical characteristics. First, these are areas that are distinct as to technical and investment conditions. Next, they are generally homogeneous in terms of load and barriers to investment in transmission and generation. Also, they are distinguished by consistent price separation from other areas. Finally, these distinguishing characteristics must be enduring rather than existing over the short-term. All load in an LMA will be required to purchase a percentage of its capacity consistent with the limits of capacity transfers against demand.

The EITCC recognizes two areas that generally satisfy these criteria: Eastern MAAC and Southwestern MAAC. In order to ensure that existing contracts or state-mandated supply agreements are not undercut, new LMAs are established through the PJM stakeholder process only after five years advance notice.

LMAs are identified to structure long-term incentives for development of additional resources in the form of generation, demand response or merchant transmission. PJM's planning analysis will identify LMAs and determine the specified level of local commitment that is required in order to satisfy reserve margins. However, location-specific capacity requirements are enforced in LMAs only to the extent that price separation occurs. Each LSE is required to acquire a percentage of peak load obligation plus IRM from within the local market area with the remainder, consistent with transfer limits, from the general market. All capacity resources within the LMA will be designated as to their eligibility to provide up to a specific level of local capacity credits.

The Market Monitoring Unit screens each LMA for competitiveness. Mitigation only occurs where market conditions are found to not be competitive. Mitigation is anticipated to take only the form of offer capping with clearing prices permitted up to the Capacity Deficiency Rate. However, new resources will not be offer capped for the four

years following market entry so that effective price signals are sent to resource developers.

The initiation of requirements related to LMAs will take place consistent with the implementation of the EITCC, namely, two years after implementation of the model. Establishing local requirements no sooner will ensure that existing state programs in New Jersey and Maryland are not undermined. Specifically, some of those commitments extend through the 2006/2007 planning year and an EITCC requirement beginning in the 2007/2008 planning year will not upset already existing commitments.

### ***Enhancing Transmission Planning***

The recently identified load deliverability issues in New Jersey are direct evidence of the need to improve the transmission planning process. The seriousness of these issues is due, in part, to the inability of the existing planning methodology to recognize the impact of potential generation retirements. As a result of this analytical blind spot, PJM could only analyze the reliability impacts of generation retirements after they were declared by the generation owners. In addition, the existing RTEP's five year horizon is widely recognized as too short to permit timely construction of larger transmission resources or those where the siting process will create substantial delays. The EITCC refines the planning process to incorporate generation retirement risk, addresses the reasonable time needed to bring major transmission projects on line and expands the scope of the planning analysis to include more interaction at the local level among the transmission owner and the local LSEs.

The EITCC expands the planning period from five years to as much as ten years. The existing RTEP incorporates a number of assumptions, including risks such as forced outage rates and uncertain load growth. These factors are evaluated within the planning methodology looking forward over the next five years to identify where violations of reliability criteria are expected. These findings are used to pinpoint transmission projects that resolve potential violations of minimal MAAC and PJM transmission planning criteria. However, the use of a five-year forward perspective means, in practice, that reliability criteria violations beyond that five year horizon will not be addressed. The EITCC modifies this by expanding the planning period from the current five years to seven to ten years. This provides adequate time for construction of even major transmission additions. Construction of projects with a shorter lead time can be deferred until needed so that costs of this class of projects do not prematurely impact consumers.

The EITCC model directly incorporates generation retirement risk as a standard component of transmission planning. The analysis of generation retirement risk requires a method for determining the probability that any given unit will retire. Factors to be considered may include the age, condition, profitability, operational limits, and licensing status of existing generation. The risk of retirement will be directly compared to the

impact that each such generator has on reliability requirements. The result will be a RTEP that more closely fits expected future supply conditions. In order to avoid the risk that this process is self-fulfilling, i.e., that the identification of a generator as “at risk” will directly lead to its retirement, it will be necessary for this process to be confidential at some level. In practice, the risk that a specific generator may retire must not be revealed. It will not be necessary for market participants to know which generators might retire because it is the general planning result, the identification of necessary transmission additions, that is needed by market participants.

The EITCC includes an additional mechanism to stimulate the construction of needed transmission additions by recognizing the congestion implications of price premiums for local capacity. The cost of local capacity premiums is treated as unhedgeable congestion within PJM’s economic transmission planning rules. The affect is encouraging transmission construction that addresses economic (congestion) issues beyond what is currently identified under the current system. This may also avoid future projects required to address reliability criteria violations.

The EITCC advocates the establishment of planning standards and protocols whereby enhanced coordination between individual transmission owners and their affected LSEs can resolve local transmission deliverability issues. The goal of this approach is comprehensive - to plan the functionally distinct parts of the entire system as it is operated, not just the bulk grid. Additionally, the RTEP will continue to evaluate deliverability into the established local deliverability areas as determined by the Capacity Emergency Transfer Obligation/Limit (CETO/CETL) test. This component of the current methodology will be an important component to addressing local reliability areas as a backstop for non-competitive areas as discussed below.

To further ensure local capacity adequacy, the EITCC will include an annual Local Reliability Assessment (LRA) for areas that are smaller than an LMA. This LRA will consist of an analysis similar to that run for an LDA during the RTEP process where PJM assesses the deliverability criteria of each LDA. The analysis will look ahead two years to identify changes in load, generation, or other factors that will cause a localized capacity problem before an RTEP approved transmission fix can be constructed. If such a problem appears in the analysis, PJM will issue a request for proposal for a reliability solution covering a term that is consistent with the problem. This solution could consist of building new generation, maintaining generation that would otherwise be retired, demand response, or short term transmission upgrades.

The need for transmission additions is identified consistent with reliability criteria violations that are identified in the planning process. This means that local problems, even those well below the zonal level, can be addressed. This fine level of planning granularity provides solutions that are appropriate regardless of market of competitive conditions.

The EITCC also encourages market responses to transmission deliverability problems by granting long-term capacity transfer rights (CTR) to merchants who construct transmission that addresses local issues. Where local requirements exist, new merchant transmission capacity does not increase the CETL. Instead, the merchant developer receives capacity transfer rights equivalent to the summer loading limits of the facilities that it constructed. Customers in an area with a local capacity obligation can satisfy some of that from external sources by paying for firm transmission on the merchant transmission resource. To ensure that more efficient capacity solutions are not shut out of the market, the volume of the CTR will be established for a standard period, perhaps five years, and then revisited thereafter based on an updated assessment of transfer capability.

The transmission planning approach under the EITCC is more forward-looking and more thorough than the existing model. The horizon over which planning is effective is expanded from five to ten years. The risk of generation retirement is integrated into planning. Merchant transmission is encouraged through the granting of long-term transmission rights. The methodology used to determine where transmission will be built to relieve congestion is expanded. The LRA mechanism ensures that looming localized issues are proactively addressed before they become a reality under a competitive procurement process. This more robust approach will work to prevent the future evolution of transmission deliverability problems such as those in New Jersey.

### ***Conclusion***

The Enhanced Integrated Transmission and Capacity Construct will continue the high level of reliability that consumers in this region have received for many decades. Expanded transmission planning is combined with an enhanced capacity market approach to better ensure reliability at prices that are just and reasonable with respect to market conditions. In the short-term, some RMR contracts may be necessary as temporary and transitional measures to develop a transmission grid sufficiently robust to support a competitive energy marketplace. Prices will evolve over several years prior to a planning/commitment year so that potential developers of new resources have ample information indicating when and where opportunities may arise. A local construct prices resources consistent with the balance of transmission and local generation. All of this takes place within a context of reasonable and responsible market oversight. In conclusion, the EITCC strikes a balance between security and flexibility so that future capacity shortages, locally or generally, are prevented.