Virtual Regional Dispatch
Market Improvement or Impediment?

A Memorandum on Virtual Regional Dispatch Submitted on Behalf of the Transmission Owners LIPA and NYPA[1]

In joint NY/NE meetings, certain market participants have stated that Virtual Regional Dispatch (VRD) is an ill-conceived solution to the known seams problem of lack of price convergence at the borders of the Northeast ISOs. Some market participants have characterized the VRD proposal as an improper intrusion into the markets by the ISOs, and an attempt to gloss over shortcomings in the ISO's scheduling and dispatch systems. This paper attempts to discuss some of the potential benefits of VRD for the entire Northeast region, including PJM, with an important caveat that a final decision on VRD will require additional analysis and further definition of the specific features of the proposal.

Prior to specifically addressing VRD it is instructive to examine the operation of the Northeast markets with respect to transactions that exist entirely within the borders of their respective control area, i.e., purchases and sales in the centralized LMP markets and bilateral transactions with injection and withdrawal locations within the physical borders of each control area. The current market systems were carefully designed to allow LMP markets and bilateral transactions to coexist, with no bias favoring either type of transaction. Indeed market data shows substantial volumes of both LMP and bilateral transactions.

In real time, underlying the markets is the security constrained dispatch (SCD) system. Electric power systems require the constant balancing of supply and consumption within the physical limitations of the transmission and distribution facilities. Each injection or withdrawal interacts with and impacts every other injection and withdrawal, governed by the laws of physics. It is this complex set of interactions that prohibits a system relying solely on bilateral physical transactions. Bilateral transactions must be scheduled in advance and are not capable of constantly balancing the system. SCD is used to direct generation on dispatch to constantly balance with load and to do so in the most economic manner based on supplier bids. The energy transactions that achieve this balancing occur in the ISO's centralized real-time market.

In many other markets, it is sufficient to define property rights, and then let market participants trade with one another. It is the complex set of interactions that we observe in electricity, and the need to ensure on an ongoing basis that the operation of a

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constantly changing power system does not lead to violations of physical constraints on the production and transmission of electricity within that system, that create the need for a centrally coordinated dispatch and preclude reliance on electricity markets in which physical transmission rights are defined and market participants are left to trade among themselves.

However, the benefits of centrally coordinated dispatch are not limited to managing the reliable operation of the power system. SCD, and the LMP-based real-time market that is centered on the result of the dispatch performed by SCD, bring important economic benefits to market participants as well. In a market based on physical transactions, the number of transactions that can be accommodated must be limited by the number of physical rights that are available. Since the control area operator cannot know in advance the actual impact on constraints in the system by a transaction using physical rights, the number of rights allocated must be conservative. As a result, the number of transactions scheduled will tend to be significantly less than the number of transactions that actually could have been accommodated on the transmission system, had the actual impact of each transaction on each constraint been known.

In an LMP market, bilateral transactions become financial transactions, as opposed to physical transactions. Since the ISO is free to dispatch the system constrained only by physical constraints, it can reconfigure the dispatch as frequently as needed in order to respond to changing conditions. As a result, it will make greater use of the transmission system. Similarly, in an LMP-based market, instead of being restricted to using their own generation (or, perhaps, a limited number of other generators that can make use of the same physical transmission rights) to fulfill obligations to produce energy under a bilateral transaction, market participants are free to purchase energy off the spot market to fulfill their obligations when it is to their financial advantage to do so (when the price in the spot market is less than the cost of running their own resource). This permits more transactions to occur, and at lower cost.

It is these types of benefits that VRD is attempting to capture across control area boundaries. Today inter-control area transactions are for the most part limited to physical bilateral transactions. The spot markets in the adjacent control areas operate without adequately considering the interactions with the adjacent control area resources. Prices in each area are set in real time without regard to the capabilities and opportunities that exist in the adjacent area. Often this results in inefficient pricing at the boundaries. Each area sees a price difference between its proxy bus representation of the adjoining area and its own boundary buses. When these differences line up such that the import from one area is economically consistent with the export from the other, then additional exchanges are economically justified and should be effected by both areas.

VRD potentially represents a first step in reaching the benefits that LMP markets have brought to the individual control areas across a broader Northeast region. It is not limiting the role of market participants. If anything, it is expanding the opportunities of those market participants that have offered supply bids into the respective markets by allowing those bids to be considered in the adjacent markets when market and system conditions warrant.

The “perfect” solution is to optimally dispatch the systems through a centralized dispatch where they are modeled as one system. Short of dispatching the systems as one, the next best solution is to have a coordinated dispatch between ISO’s. Granted VRD is not a “perfect” solution as it does not perform dispatch changes automatically considering all of the constraints of the combined region, but it is a reasonable step in that direction. VRD should not impede bilateral transactions. It should act to facilitate economically justified transactions across a wider market.

The development of VRD has significant market implications in resolving price convergence issues across all boundaries between control areas managing LMP market designs. The ISOs should continue in their efforts to develop VRD, but should also quantify the potential incremental benefits (i.e., beyond RTS and the elimination of rate pancaking) and implementation costs across all neighboring control areas.

More work is needed to define exactly how VRD will be implemented, and how it will be coordinated between multiple control areas. As always the “devil is in the details.” Of particular importance is the need to develop a robust methodology to identify proxy buses in order to preclude inefficient outcomes. It is clear, however, that an opportunity to broaden the scope of the Northeast markets, rationalize pricing and increase liquidity are all worthy goals that should be pursued.

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