



Independent Distribution System Operator – Do we need them and why?

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May, 2015

Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/ Distribution/ generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "[Smart Grid Redefined: Transformation of the Electric Utility](#)" and "[Electric System Operations – Evolving to the Modern Grid, 2nd Edition](#)", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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Setting the Context:

Before wholesale deregulation happened in the early-to-mid 1990s, all utilities worldwide were vertically integrated with full control of the entire electric chain (all the way from generation to consumption). This approach worked for several 10s of years while the electric system in North America was undergoing its largest expansion ever. And then FERC orders 888/889 happened!!!

With the two FERC orders – two main actions happened.

- (1) Generation of the energy was considered deregulated meaning that a utility should separate out all of its generation and trading functions into an independent entity separate from the rest of the utility
- (2) Transmission was considered a monopoly and also ordered to be independent from everything else so the use of transmission needed to be procured through open and transparent mechanisms and a system called OASIS (Open-Access Same-time Information System) was born.

When the FERC orders came in – everyone said that electric industry deregulation could not work – and that blackouts and energy shortages would ensue. Barring a few exceptions of Enron-led gaming as in the California markets, it is fair to say that electricity markets have worked well and have been successful in working through several major policy changes across the country. However, it was key to note that much of the deregulation (with the exception of Texas) happened at the wholesale (Transmission) level.

So – why can't this happen to Distribution?

Transmission versus Distribution:

While much of this is quite obvious – it is still important to state it here that Transmission and Distribution for the most part are quite different. Here are some high-level points of difference and why they matter.

- Transmission, for the most part, is networked whereas distribution, for the most part, is radial. This means that there are multiple ways to get power to a specific location, unlike distribution where each location only gets power from one source.
- Much of the existing generation is still very centralized – large centralized generation that pump in energy directly into the transmission system.

So, this means that the lessons learned from wholesale deregulation cannot be applied to distribution – right?? Wrong!!!!

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So – what is changing??

With New York and California leading the way, it is very clear that the next area of change is to see more supply from the distribution side of the grid. This was necessitated by the retirement of several large centralized generators due to EPA and other rulings.

- *The newer sources of power are also from renewable sources meaning that they are intermittent in nature and generally cannot be dispatched.*
- *Newer mechanisms such as microgrids are coming into play which can almost be defined as smaller grids within the existing distribution grid. These grids have the ability to be somewhat self-sufficient in energy supply-demand under some circumstances.*
- *The advent of AMI and better sensing mechanisms in the field is allowing distribution utilities to control demand in ways that were considered not possible before.*

So, what about the Independent Distribution System Operator?

Real changes are coming to the distribution system as well. If the State of New York has its way and all the signs are there that it will – we will have the beginning of a Distribution System (and Market) Operator. New York is calling it the Distribution System Platform Provider or DSP and has set up a stakeholder-driven process to put it in motion. For starters, it is expected that the existing utilities will run this operation. This is an acceptable situation for now because the number of independent participants is still small in number and small in terms of amount of energy pumped into the grid.

However – if and when

- *The number of independent participants – people who either own generation that delivers power into the grid – goes up and/or*
- *The number of microgrids capable of some level of independent operation – goes up and/or*
- *Retail providers start aggregating customers and/or providers to be able to deliver significant amounts of power into the distribution grid*
- *Or others – then*

We should at least have a conversation about making this DSP (or a different name) independent. And this should not be just considered a New York state issue – It is fair to expect that every state will be moving in this direction at some point soon. Everyone is watching New York.