

## **Congestion Analysis of Transmission Corridors of the Eastern Interconnection**

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### **ABSTRACT**

Analysis described in this paper has been largely conducted in the context of the simulation analysis of the Eastern Interconnection conducted by CRA International in support of the National Electric Transmission Congestion Study released by the US Department of Energy (DOE) in August of 2006. DOE conducted this congestion study as directed by the Section 1221 of the Energy Policy Act signed into law by President George W. Bush on August 8, 2005. Additional analysis of simulation results vis-à-vis historical operational and market data has been undertaken in response to various stakeholder comments DOE received after the Congestion Study have been released. On April 26, 2007, based on the results of the study, comments thereon and consideration of a broad set of economic, reliability and energy security criteria, the Secretary of Energy announced two draft designations of National Corridors: the Mid-Atlantic Area National Corridor and Southwest Area National Corridor.

DOE Commissioned CRA International to carry out a spectrum of analytical assignments in support of this congestion study primarily focusing on the Eastern Interconnection part of the U.S. power grid. In the process of conducting this work, we discovered that there is no adequate functional definition of a transmission corridor, that no analytical tools readily exist to analyze congestion of transmission corridors, that good and comprehensive data required to conduct the analysis are difficult to find, that the results of the analysis are voluminous and are difficult to summarize and present. In this paper, we describe how these challenges were addressed.

The novel methodology described in the paper introduces a functional definition of a power transmission corridors and develops a methodology to systematically define such corridors, measure their importance and level of congestion. The applied analytical techniques combine spatial cluster analysis of electricity markets with GIS data processing, chronological production cost simulations and power flow analyses. The paper will specifically demonstrate how the analytical methodology was applied to the analysis of transmission congestion in the Mid-Atlantic Area National Corridor.