

January 18, 2011

Honorable Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20246

**Re: Informational Filing of Midwest Independent Transmission  
System Operator, Inc.'s Independent Market Monitor**

Dear Secretary Bose:

Pursuant to the Commission's order in *Midwest Transmission System Operator, Inc.*, 118 FERC ¶61,020 at P 12 (2007)<sup>1</sup> the Independent Market Monitor ("IMM") hereby submits this informational report on the effectiveness and need for changes in the Narrow Constrained Area ("NCA") designation approved on January 19, 2007.

This report contains an updated evaluation of the tariff criteria used to designate the existing NCAs and evaluate the applicable NCA thresholds. The report also includes a summary of the mitigation that was implemented in the NCAs for the Midwest Independent System Operator (MISO) administered energy markets and an assessment of the effectiveness of the NCAs.

**I. Background**

Market power mitigation measures contained in the Midwest ISO Tariff are designed to mitigate market power that arises when transmission constraints that limit competition in certain areas of the market bind. Such constraints create locational market power. Two types of constrained areas are defined: Narrow Constrained Areas and Broad Constrained Areas ("BCAs"). NCAs are explicitly designated because they are chronically constrained and raise more severe locational market power concerns. BCAs are not explicitly designated and include all other constrained areas.

The purpose of designating an area as an NCA is to utilize tighter thresholds in identifying participant conduct and measuring its impact on the market to determine when the imposition of mitigation is warranted. These tighter thresholds reflect a reduced tolerance for potential market power abuses, which is appropriate in light of the higher frequency with which the constraints are binding and, hence, the increased severity of the locational market power.

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<sup>1</sup> 118 FERC ¶ 61,020 at P 12 (2007) ("the Commission will require . . . an informational report summarizing the effectiveness or changes required to the NCA (for example, re-defining the NCA with a updated GSF or updating the NCA threshold value to incorporate new net annual fixed costs data)").

### **A. Definition of NCAs**

A constrained area warrants designation as a NCA if it satisfies two tests under the FERC-approved market power mitigation measures contained in the Midwest ISO Tariff. First, the transmission constraint must have been binding for more than 500 hours over the prior 12 months. These hours include those in which the Midwest ISO made commitments or took other actions to manage the congestion. Second, one or more suppliers must frequently be pivotal – i.e., its resources are needed to meet the load and manage the congestion in the constrained area. An area that satisfies these two tests is particularly vulnerable to market power abuse. The NCA designation is necessary to assure that wholesale electricity prices will remain just and reasonable.

### **B. Conduct-Impact Mitigation Process for NCAs**

When a flowgate within an NCA experiences a Binding Transmission Constraint, the NCA is considered to be binding. In such instances, only generators which have GSFs that exceed the Constraint GSF Cutoff are evaluated under the conduct and impact test. The test first evaluates whether the Market Participant's behavior exceeds the conduct thresholds and, if so, the price impact of the conduct is evaluated. Therefore, before mitigation is applied in an NCA, four conditions must be met: (1) there must be a Binding Transmission Constraint within the NCA; (2) the generator's GSF on the given constraint must exceed the Constraint GSF Cutoff; (3) the generator's energy offer must exceed the conduct threshold; and, (4) the conduct must cause a significant price impact.

NCA Mitigation is performed in concert with the RT-UDS for real-time in an automated process involving a conduct and impact test. Since September 30, 2007, the DA RSC has been used to evaluate day-ahead mitigation. As noted, mitigation only occurs when a unit or units have failed both an automated conduct test and an automated impact test. Conduct tests are performed every hour and impact tests (if required) are performed every five minutes for real-time and once a day for all 24 hours for the day-ahead. It is important to note that these NCA conduct and impact tests procedures are automated and involve no discretion whatsoever on the part of the IMM.

## **II. Existing NCAs**

### **A. Definition of NCA in Southeast Minnesota, Northern Iowa, and Southwest Wisconsin**

The area approved for the NCA in the Commission's Order January 2007 order includes portions of Minnesota, Iowa, and Wisconsin (i.e., the "Minnesota NCA"). The area is defined by a set of constraints that limit imports from south to north into Minnesota. There are two dominant parallel electrical paths that limit power imported into Minnesota from the south.

The first is a series of 345 KV transmission facilities in a path from Raun in western Iowa to Lakefield, to Wilmarth, and to Blue Lake in southern Minnesota. The second path is also a

series of 345 KV transmission facilities in a path from Tiffin in eastern Iowa to Arnold, to Hazleton, to Adams, to Pleasant Valley, and to Prairie Island in southern Minnesota.

Many distinct constraints are associated with these paths and each constraint includes a limiting transmission element and potentially a contingent element so one limiting element can be associated with many constraints. A list of the transmission constraints that define the WUMS and SE Minnesota NCA constraints are periodically updated on the Midwest ISO web page.

#### **B. Definition of NCA in Wisconsin and Upper Michigan (WUMS) and Northern Wisconsin and Upper Michigan (NWUMS)**

Two additional NCAs were approved by the Commission at the start of the Midwest ISO energy market. The first is the Wisconsin Upper Michigan System (“WUMS”) area, which includes eastern Wisconsin (east of the Arpin bus) and the Upper Peninsula of Michigan. The second is North WUMS, which includes only the Upper Peninsula of Michigan. North WUMS is a sub-region within WUMS. The transmission constraints that define these NCAs are posted on the Midwest ISO website. For the purpose of this analysis the WUMS region is analyzed as a whole since North WUMS is a subregion of WUMS.

#### **C. NCA Constraint Definition**

The initial list of the transmission constraints that defined the NCA constraints for these areas are supplemented over time using the same analytical procedures used to define the original list. Each of these constraints can limit power flows from outside to inside the NCA.

#### **D. NCA Units**

A table showing the list of generators that are included in the NCA is posted on the Midwest ISO website. The list may be modified based on transmission system topology changes.

### **III. Updated NCA Definition Criteria**

The first analysis needed to determine whether an area should be designated as an NCA identifies the frequency with which the relevant constraints were binding. Table 1 shows the number of binding constraint hours during the past 12 months in the Minnesota and WUMS NCAs. The “Constraint” columns in Table 1 show hours when a binding constraint resulted in a redispatch of generation. The “Total” columns include these hours, as well as hours in which supplemental generator commitments were made in anticipation of congestion into the NCA.

**Table 1: Binding Constraints**

	Minnesota NCA		North WUMS NCA		WUMS NCA	
	Constraints	Total	Constraints	Total	Constraints	Total
Jan	16	45	1	11	68	233
Feb	25	54	81	87	20	91
Mar	38	40		1	15	55
Apr	54	61		34	4	5
May	95	107		25	69	86
Jun	21	23	50	66	44	51
Jul	17	20	139	182	32	35
Aug	43	45	233	248	39	43
Sep	30	35	159	172	38	38
Oct	113	121	78	86	18	18
Nov	11	14	194	208	5	5
Dec	4	4	98	128	1	1
<b>Total</b>	<b>467</b>	<b>569</b>	<b>1,033</b>	<b>1,248</b>	<b>353</b>	<b>661</b>

During the past 12 months, there were 569 hours when the NCA constraints were binding in the real-time for the Minnesota NCA. In WUMS, there were 661 hours with binding constraints in the real-time and additional 587 hours had a binding constraint in North WUMS for a total of 1,248 hours. Hence, the 500-hour NCA criterion is satisfied in North WUMS.

The frequency of congestion in the Minnesota NCA increased substantially during the end of 2006 and continued throughout 2007. The congestion declined considerably in 2008 with milder weather, the return of key generating facilities, and increased imports over the interface with Manitoba Hydro. The substantial increase in wind generation in the West also reduces congestion into the Minnesota NCA (though it does typically also create more localized congestion). Significant additions to wind capacity continued in 2009 and 2010 contributing further to decreased congestion from south to north into Minnesota. Nonetheless, we expect that the constraints that define the Minnesota NCA will continue to surpass the 500-hour criteria during the next 12 months.

Congestion in WUMS also declined in 2010 compared to prior years, in part due to the addition and enhancement of key transmission facilities as well as new generation additions. The congestion is now often from north to south from WUMS to Com Ed. However, congestion remained above 500 hours. Although there have been a number of transmission projects in WUMS, we still expect that the constraints that define the WUMS NCA to surpass the 500-hour criteria during the next 12 months.

The second criterion is that one or more suppliers are typically pivotal when the NCA constraints are binding. A supplier is pivotal when a Binding Transmission Constraint cannot be managed with other suppliers' generation resources, i.e., the resources of the pivotal supplier are needed to manage the constraint. To determine whether a supplier is pivotal, we evaluate the GSFs for generators owned by the various suppliers that affect the constraint. The GSFs indicate what portion of a unit's incremental output flows over the constraint. Once these are determined for all generating units, the total impact that an individual supplier has on a constraint can be calculated.

The basic approach is to change a supplier's output in a manner that maximizes congestion on a transmission constraint. The impact of this additional flow on the constraint is then compared to the impact that all other suppliers' generation has on the constraint if this generation is re-dispatched to relieve congestion on the constraint. If the impact of the individual supplier is sufficient to cause the limit for the constraint to be exceeded even when the other suppliers are re-dispatched to minimize the flows over the constrained facility, the supplier is pivotal.

This analysis is based on interval level results of the real-time energy market. The results find that of the congested intervals (instances when an NCA constraint is binding in the energy market), the vast majority had at least one pivotal supplier in both the Minnesota and WUMS NCAs. During the twelve months of 2010, typically both the WUMS and SE Minnesota NCAs had pivotal suppliers in more than 78 of the congested intervals.

**Table 2: Percentage of Congested Intervals with Pivotal Suppliers**

	<b>Minnesota NCA</b>	<b>North WUMS NCA</b>	<b>WUMS NCA</b>
1/1/2010	92%	100%	87%
2/1/2010	78%	97%	99%
3/1/2010	92%		96%
4/1/2010	89%		98%
5/1/2010	93%		95%
6/1/2010	98%	100%	90%
7/1/2010	98%	100%	91%
8/1/2010	99%	100%	100%
9/1/2010	97%	100%	100%
10/1/2010	95%	100%	100%
11/1/2010	95%	100%	100%
12/1/2010	83%	100%	100%

#### IV. NCA Threshold

In 2010, the NCA thresholds were updated for the Minnesota NCA and WUMS NCAs. The locational threshold for an NCA is defined in the tariff to be equal to:

$$\text{Narrow Constrained Area Threshold} = \frac{\text{Net Annual Fixed Cost}}{\text{Constrained Hours}}$$

The Net Annual Fixed Cost is equal to the revenue per megawatt that would need to be earned by a new peaking generator in excess of the net revenue it can expect to receive from the Midwest ISO electricity markets to cover its fixed costs, including return on equity. The net revenue from the Midwest ISO electricity markets would equal the market revenue that could be expected from the unit minus its variable production costs. In other words, the threshold would allow price increases in the Narrow Constrained Areas to the extent that additional profits derived from energy sales in these areas would be sufficient for a new peaking unit to profitably enter the market.

Constrained Hours are defined as the total number of hours during the 12-month period when there is a binding transmission constraint. This number cannot exceed a maximum of 2,000 hours. As shown above, Binding Transmission Constraint hours for 2010 in the Minnesota NCA equaled 569. In the WUMS, NCA the total was 661.

The Net Annual Fixed Costs were determined by obtaining an estimate of the overnight capital cost of a conventional combustion turbine made by the Energy Information Administration and deriving gross annualized fixed costs of \$95.69 per KW-year and subtracting the Net Revenues for the prior 12-month period. The Net Revenues were calculated using:

- an assumed heat rate of 10,500 mmBTU/KWh;
- daily gas prices based on the Chicago Citygate price plus a combined basis differential and distribution charge of \$0.61/mmBTU for the WUMS areas and of \$0.38/mmBTU for the Iowa/Minnesota area;
- a forced outage rate of 5 percent; and
- minimum run-time of 1 hour.

With these assumptions, the estimated net revenue for the period from January 2010 through December 2010 was \$30.22 per KW-year for WUMS, \$65.28 per KW-year for North WUMS, and \$35.11 per KW-year for SE Minnesota.

Based on these values, I calculate an NCA threshold for the energy component of suppliers' offers of \$99.04 per MWh for WUMS, \$24.37 for North WUMS, and \$105.91 per MWh for SE Minnesota per the formula specified in Section 64.1.2(d) of the Midwest ISO Tariff. These values will be posted on the web site and will be made effective in the Midwest ISO production systems on January 25<sup>th</sup>, 2011.

**V. NOTICE AND SERVICE**

**A. NOTICE**

Please place the following persons on the official service list in this proceeding:

David B. Patton  
9990 Fairfax Blvd., Ste 560  
Fairfax, VA 22030  
dpatton@potomaceconomics.com

\* Persons designated to receive official service.

**B. SERVICE**

The IMM has served all parties provided in the Commission's eService list for the above-referenced dockets. In addition, the IMM notes that the Midwest ISO has served a copy of this filing electronically, including attachments, upon all Tariff Customers, Midwest ISO Members, Member representatives of Transmission Owners and Non-Transmission Owners, the Midwest ISO Advisory Committee participants, as well as all state commissions within the Region. In addition, the filing has been posted electronically on the Midwest ISO's website at [www.midwestmarket.org](http://www.midwestmarket.org) under the heading "Filings to FERC" for other interested parties in this matter.

**VI. CONCLUSION**

The IMM for the Midwest ISO respectfully requests the Commission to accept this informational report submitted in compliance with the directives set forth in the January 19, 2007 Order.

Respectfully submitted,

*/s/ David B. Patton*

Dr. David B. Patton  
Potomac Economics, Ltd.