

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

In the Matter of the Application of Aquila,)	
Inc., d/b/a Aquila Networks - MPS and Aquila)	Case No. EO-2008-0046
Networks - L&P for Authority to Transfer)	
Operational Control of Certain Transmission)	
Assets to the Midwest Independent Transmission)	
System Operator, Inc.)	

MIDWEST ISO'S RESPONSES TO
DOGWOOD ENERGY, LLC DATA REQUESTS TO MISO

Midwest Independent Transmission System Operator, Inc. ("Midwest ISO"), provides the following responses to the Data Requests submitted to it by Dogwood Energy, LLC ("Dogwood") on or about December 18, 2007, all pursuant to 4 CSR 240-2.090:

31. **Reference:** Page 8, lines 8-11. Will the presence of Aquila in MISO improve average system reliability?

Response: The addition of any new member into the Midwest ISO will increase the size and scope of the overall system, thereby incrementally improving the average system reliability, while at the same time having a far greater impact and improvement on that individual new member's reliability. In general, scale and scope benefits to reliability result from "risk pooling" as a larger number of generators become available to respond to unanticipated events on the transmission system, such as a loss of generation or transmission, and by increasing the number of transmission facilities monitored and directly controlled by a single entity. As such, the addition of a new member to a large system incrementally improves reliability of the large system by increasing the size of the risk pool. The relative benefit is much greater for the new member due to the much larger relative increase in the generation pool and size of the transmission system of the larger system

a. If so, by how much?

Response: The incremental reliability impact of Aquila formally joining the Midwest ISO has not been specifically measured. The analysis performed by Midwest ISO has evaluated the reliability benefits of the current fully participating members and has not attempted to evaluate relative gains of additional, discrete member companies. The system-wide analysis attempting to identify and quantify the reliability benefits is further explained in Section III beginning at page 7 of the Rebuttal Testimony of Richard Doying, filed in this matter.

b. Has MISO performed any calculations of the reliability improvement benefits?

Response: See Response to Data Request 31(a), above.

c. If so, please provide all supporting data, work papers, and analysis. If not, please explain the basis for the proportional assumption of benefits to load and generation that Mr. Doying makes

Response: See Response to Data Request 31(a), above.

32. **Reference:** Page 10, lines 9-16. What is the basis for the overall reliability benefit range of \$230 million to \$340 million? Please provide all data, work papers, and analysis Mr. Doying relied on to develop that range.

Response: The reliability benefit estimates were developed through the review of a group of studies, surveys and technical analysis. They represent an estimate of the benefits for a snapshot or single point-in-time for the Midwest ISO system. The reliability benefit range was estimated based on the reduction in probability, size, and duration of a hypothetical outage based on the enhanced system monitoring and reaction capability of a regional operator, such as the Midwest ISO relative to the typical operating processes and systems of individual utilities. The estimated economic cost of an outage in terms of system costs as well as the resulting direct and indirect costs of grid customers is applied to the reduced outage data. The methodology relies on a combination of NERC historical data and probability analysis to estimate the probability of an outage with and without the Midwest ISO, as illustrated on page 4 of attached Exhibit A.

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The estimated outage size was developed for small and large outage scenarios, with and without the Midwest ISO, supported by NERC disturbance data noted on pages 5 and 8 of attached Exhibit A. The large outage scenario assumes a 33% load loss for a major event with the Midwest ISO versus a 50% load loss without the Midwest ISO. The lower loss of load results from the larger regional footprint and state of the art monitoring systems and processes in place at the Midwest ISO.

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Outage duration is largely a factor of outage size and access to generation resources to restore power on the transmission grid. A typical recovery profile was used to estimate the corresponding improvement in recovery time as a result of the reduced outage size (see pages 5 and 8 of Exhibit A). Historical NERC data comparing ISO and non-ISO territories was used to arrive at the duration estimate.

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The economic cost of an outage in terms of megawatt hours was estimated to be between \$7,440 and \$11,160 per Mwh, based on a range of academic and industry studies over a number of years. These costs include the generation plant shut-down, start-up and network costs, the costs incurred by grid customers in responding to the outage as well as forgone opportunities due to the power loss.

The calculation of the overall benefit range based on these factors is provided in Exhibit A on page 10, which shows the derivation of the approximately \$230 to \$340 million dollar estimate range.

- a. Does Mr. Doying or MISO believe that Aquila would obtain reliability benefits by joining SPP? Why or why not?

Response: See Response to Data Request 31, above. The specific impacts of Aquila formally joining SPP has not been reviewed or studied by either Mr. Doying or Midwest ISO. In general, reliability benefits would be expected from Aquila joining any RTO where such RTO structure and operations increased the relative risk pool in which Aquila participates. The level of reliability benefits that accrue to Aquila will vary based on the relative size of the RTO and the operational characteristics and, for example, the timeframe in which congestion management occurs and the number of generators that are available to participate in such congestion management.

- b. What would be the magnitude of these reliability benefits from joining SPP?

Response: See Response to Data Request 32(a), above.

- c. Would it be reasonable to estimate those reliability benefits from joining SPP using the same proportionality argument raised by Mr. Doying? If not, why not?

Response: In general, the reliability benefits that accrue to a member of an RTO are proportional to the relative sizes of the member's system and larger RTO system. For a given company, the reliability benefits would be larger where the RTO is larger. The relative reliability benefit would also depend on the operational characteristics of the RTO as discussed in Response to Data Request 32(a), above.

33. **Reference:** Page 11, lines 9-19. What is the basis for the overall dispatch efficiency benefit range of \$450 million to \$600 million? Please provide all data, work papers, and analysis Mr. Doying relied on to develop that range.

Response: The estimate of \$450 to \$600 million per year of potential benefits was derived from a series of studies conducted by ICF International (ICF) commissioned by management for the purpose of evaluating performance of the Midwest ISO markets and an internal study of the benefits of an ancillary services market. The estimated benefit range represents the benefits of dispatch efficiencies in both the power and ancillary services markets created by operating the Midwest ISO as a single market in lieu of a set of isolated control areas. Both studies are point-in-time studies, and the absolute level of benefits may vary with varying underlying factors, such as load patterns, fuel prices, available capacity, and transmission capacity.

The power dispatch efficiency benefits are estimated based on the ICF Consulting study analyzing the dispatch efficiency of the Midwest ISO system comparing an optimum dispatch of the individual control areas on a standalone basis versus an optimum dispatch of the regional system. There are two components of dispatch efficiency. First is the generation dispatch for the power needs of the grid. Second is the dispatch of ancillary services across the grid. The basic source of both efficiencies is the pooling of requirements and allowing the most efficient providers to supply the energy and ancillary services needs of the broad region. This allows the more efficient plants to provide more services, and reserves less efficient facilities for peak periods creating an overall benefit to the market. The analysis used a market model to simulate the operation of the region both with and without RTO capabilities. .

To create the estimate of benefits, the Midwest ISO extrapolated the January to August 2006 study period through the remainder of the calendar year. The 2005 results were not used as they largely reflected systemic learning and model maturation during initial market start-up. The 2006 actual results were \$133 for the period of January through August, which are annualized by taking the average monthly rate of \$16.6 million and projected to an annual benefit of approximately \$200 million. The full potential benefit was calculated at \$167 million for the January through August period, or an average monthly benefit of \$20.9 million. This potential benefit is projected to be approximately \$250 million. The analysis is illustrated in Exhibit B on pages 1 and 2.

The estimate of the ancillary services benefits is derived from an internal study used to demonstrate the benefits of the Midwest ISO's Ancillary Services Market (ASM). The study used similar production cost modeling and simulations to that used for the power generation analyses. The analysis estimated benefits in the areas of operating reserves markets, operational coordination, regulation markets and non-coincident peaks.

1. ASM Operating Reserves Market Implementation – The ASM market design allows for the co-optimized commitment and dispatch of operating reserves with the current Midwest ISO Energy Market. This co-optimization results in a general shift of committed generation from higher cost units to lower cost units and the higher cost units being used for reserves rather than for energy dispatch. Based on the production cost simulation studies conducted, the estimated benefits of implementing an ASM Operating Reserves market are between \$51 - \$76 million annually.
2. Optimized Operational Coordination – Under the current market configuration, the Midwest ISO is not a Balancing Authority and cannot access operating reserves in the same manner as Balancing Authorities have traditionally deployed them. To compensate for that lack of access to operating reserves to address certain system conditions, the Midwest ISO tends to carry an amount of committed capacity in excess of expected system load. The Midwest ISO will become a Balancing Authority in conjunction with the implementation of the ASM market and hence the need for this excess capacity will be reduced. Based on the production cost simulation studies conducted, the estimated benefits for this optimized operational coordination are \$23 - \$33 million annually.
3. ASM Regulation Market Implementation – The regulation function in the Midwest ISO footprint is currently performed by numerous balancing authorities each regulating to their own individual Area Control Error (ACE). This requires each balancing authority to commit capacity to perform this regulation function. The total of the regulation that is held by these multiple balancing authorities is appropriate for them each to maintain their areas, but is in excess of what would be required to maintain an integrated ACE of the entire region. This study calculated the value of this reduced commitment at \$38 - \$96 million annually. This estimate is based on a 30% reduction in the committed regulation and valuing that reduction at \$10 - \$25 per MW per hour.
4. Optimization of Non-Coincident Peaks - Non-Coincidental peak benefits are derived from the ability to evaluate the broader system instead of summing the peaks of the individual balancing authorities. The primary benefit is the result of system diversity in geography and load. The non-coincident peak benefit was estimated at \$1-\$3 million annually. This estimate is based on a 16 MW reduction in the regulation requirement and valuing that reduction at \$10 - \$25 per MW per hour.

Two other benefit areas were identified: a reduction in generator maintenance costs due to the overall reduction in the amount of movement required from generation units supplying regulation; and the co-optimized commitment and dispatch of regulation together with operating reserves and energy. However, due to the complexity of the performing calculations and simulations to accurately estimate these benefits, no estimate has been made for these benefit areas.

The results of this study are illustrated in Exhibit B on page 3. A more complete discussion of the analysis is available in Exhibit B (a); a copy of Midwest ISO's filing with the FERC on pages 12 through 15.

The combined benefit of the power dispatch and the ancillary markets provides a range of \$372 and \$646 million annually. This range comes from a power dispatch range of \$200 to \$250 million and an ancillary services market range of \$172 to \$396. The referenced range of \$450 million to \$600 million represents a reasonably conservative expected outcome of the two ranges.

This analysis was originally performed to support the filing of Midwest ISO's ASM market tariff with the Federal Energy Regulatory Commission (FERC). FERC agreed that the ASM market provided net benefits to the market, and approved the tariff. These estimates represent preliminary analyses developed specifically for internal use by Midwest ISO management and are not intended to be viewed as exhaustive or final, but rather it is an initial effort designed to assist in ongoing measures, monitoring, and improvements by the Midwest ISO of its practices and procedures.

a. Will Aquila benefit from reduced contingency reserves by joining SPP? Why or why not?

Response: See Response to Data Request 32(a), above.

b. What would be the magnitude of these reduced contingency reserve benefits from joining SPP?

Response: See Response to Data Request 32(a), above.

c. Would it be reasonable to estimate those contingency reserve benefits from joining SPP using the same proportionality argument raised by Mr. Doying? If not, why not?

Response: See Response to Data Request 32(c), above.

34. **Reference:** Page 11, lines 9-19. Will the presence of Aquila in MISO reduce average generating costs in MISO?

Response: The question is unclear and vague as to the phrase “average generating costs” because it does not identify whose generating costs are being focused on or what “costs” are being measured or at issue. If the question refers to regional production costs to meet total energy and ancillary services needs, the Midwest ISO has not evaluated the incremental change in production cost with or without Aquila as a member of the Midwest ISO. In general, economies of scale are realized as the number and diversity of available generation increase. However, the change in production cost for a region may be higher or lower when adding a new member depending on the relative generation characteristics of each system.

a. If so, by how much?

Response: See Response to Data Request 34, above.

b. Has MISO calculated the total dollar savings because of more efficient dispatch with Aquila’s generating units? If so, please provide all supporting data, work papers, and analysis. If not, please explain why not.

Response: See Response to Data Request 34, above.

39. Has MISO prepared any empirical studies comparing the magnitude of the benefits referenced by Mr. Doying with those that are provided to SPP members?

Response: No. The Midwest ISO has not conducted comparative analysis of benefits in the Midwest ISO region versus benefits available in other regions or RTO markets.