



SULLIVAN, MOUNTJOY,
STAINBACK & MILLER, P.S.C.
Attorneys

Tyson Kamuf
Attorney
tkamuf@smsmlaw.com

September 29, 2016

Skill. Integrity. Efficiency.

VIA FEDERAL EXPRESS

Dr. Talina R. Mathews
Executive Director
Public Service Commission
211 Sower Boulevard, P.O. Box 615
Frankfort, Kentucky 40602-0615

RECEIVED

SEP 30 2016

PUBLIC SERVICE
COMMISSION

RE: *Application of Big Rivers Electric Corporation to Transfer Functional control of Its Transmission System to Midwest Independent Transmission System Operator, Inc., P.S.C. Case No. 2010-00043*

Dear Dr. Mathews:

Finding number two of the Public Service Commission's November 1, 2010, order in the above-styled matter requires Big Rivers Electric Corporation to "file a report by September 30 of each year describing its current evaluation of available options for complying with NERC's contingency reserve requirement and its review of the short-term and long-term costs and benefits of continued membership in Midwest ISO." An original and ten copies of Big Rivers' report for 2016 are enclosed.

I certify that a copy of this compliance filing has been served on each party of record in the above-styled matter. Please contact me if you have any questions regarding this filing.

Sincerely,

Tyson Kamuf
Counsel for Big Rivers Electric Corporation

Copies to: Michael Chambliss
DeAnna Speed

Service List
Case No. 2010-00043

J. Matt Harnish
Corporate Counsel
Midwest ISO, Inc.
701 City Center Drive
P.O. Box 4202
Carmel, Indiana 46082-4202

Mark David Goss
GOSS SAMFORD, PLLC
2365 Harrodsburg Road
Suite B325
Lexington, Kentucky 40504

Michael L. Kurtz, Esq.
BOEHM, KURTZ & LOWRY
36 East Seventh Street, Suite 1510
Cincinnati, Ohio 45202

Hon. Lawrence W. Cook
Assistant Attorney General
1024 Capital Center Drive
Suite 200
Frankfort, KY 40601-8204

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

Background

Big Rivers Electric Corporation ("Big Rivers") joined the Midcontinent Independent System Operator ("MISO") on December 1, 2010, to meet the mandated Contingency Reserve requirements of the North American Electric Reliability Corporation ("NERC") as approved by the Federal Energy Regulatory Commission. In 2009, Big Rivers commissioned Charles River Associates ("CRA") to conduct an economic assessment of the options available to Big Rivers for the supply of Contingency Reserve. The CRA Analysis completed in 2010 concluded that Big Rivers had no viable options for meeting its Contingency Reserve requirement other than with a stand-alone self-supply plan or by joining MISO. Based on CRA's analysis, joining MISO was estimated to be at least \$32 million less costly to Big Rivers than stand-alone self-supply over the five year period from 2011 to 2015. Big Rivers was approved by MISO for membership in December 2009 and following approval by the Kentucky Public Service Commission fully integrated into MISO on December 1, 2010.

Today's Options

Big Rivers believes that the options for meeting its Contingency Reserve requirement are virtually unchanged from what was described in the analysis completed by CRA in 2010 and as described in Big Rivers' update to the Commission in September 2015. The same obstacles which hindered or prevented participation in other reserve sharing groups exist today as were identified in the CRA Analysis. The same obstacles which hindered participation in the PJM Regional Transmission Organization ("RTO") as those

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

identified in the CRA Analysis continue to exist today as well. Louisville Gas and Electric Company and Kentucky Utilities Company ("LG&E/KU") were acquired in 2011 by PP&L Corporation ("PP&L"), and PP&L is a member of the PJM RTO. However, LG&E/KU have not changed from their Independent Transmission Operator/Reliability Coordinator ("ITO/RC") operational construct and thus are not members of any RTO.

Additionally, East Kentucky Power Cooperative's membership in the PJM RTO does not afford Big Rivers a viable alternative. Big Rivers' transmission system is neither directly interconnected with East Kentucky nor is Big Rivers indirectly connected to the East Kentucky system by virtue of significant firm transmission rights across another system. Therefore, there has been no change in the status of any options available to Big Rivers for possible participation in the PJM RTO from those described in its September 2015 update to the Commission. Thus, again in 2016, the only viable options for Big Rivers to continue to satisfy its NERC requirements are continued MISO membership and the stand-alone self-supply plan as described in the CRA Analysis which would require a withdrawal from MISO.

To meet its Contingency Reserve requirements on a stand-alone basis, Big Rivers still requires 417 MW of Contingency Reserve based on the loss of its largest single generating unit, the D.B. Wilson Unit 1. The stand-alone solution remains more expensive than MISO membership.

Under the Transmission Owners Agreement with MISO, Big Rivers was required to maintain membership for five years. Big Rivers met that obligation by remaining in MISO through the end of 2014. A one-year withdrawal notification is required prior to exit. Big

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

Rivers would need to meet the requirements in Article 5 of the MISO Transmission Owners Agreement to withdraw from MISO. Those requirements are:

- Written notice, effective at the end of the calendar year *after* notice is received (Article Five, Section I).
- Availability of continued transmission service for existing customers for the term of the service agreement (Article V, Section II.A).
- Payment of all RTO financial obligations (Article Five, Section II.B).
- Obligations to construct planned facilities (Article Five, Section II.C).
- Receipt of applicable federal and state regulatory approvals (Article Five, Section III).

Big Rivers' MISO Experience To-Date

Big Rivers has experienced no major issues in the operation of its transmission and generation systems within the MISO market from December 2010 to the present time. Big Rivers has gained a better understanding of the benefits and costs of MISO membership. As expected, the most prominent benefit of joining MISO recognized by Big Rivers has been the ability to meet its NERC Contingency Reserve requirement. Big Rivers is purchasing Contingency Reserve service for its load in the MISO Ancillary Services Market. The cost of the Contingency Reserve ancillary services from MISO for 2015 was \$260,890. The cost of the services from MISO from January through August of 2016 is \$195,127. The 2016 annualized cost is thus projected to be approximately \$292,691 (*i.e.*, \$191,127 x 12 / 8).

Under the Midwest Contingency Reserve Sharing Group operation in 2009, Big

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

Rivers had to hold back 32 MW of its generation capacity from the market to meet its reserve obligation to the other group members. In 2009, for the remainder of the year after Big Rivers assumed control of the operation of its generating plants in July, Big Rivers was able to sell 82.6% of its available generating capacity. Beginning in January 2010, Big Rivers purchased Contingency Reserve service from MISO. Thus, Big Rivers has recognized a MISO membership benefit by being able to sell additional energy into the market as a result of purchasing Contingency Reserve services. Furthermore, these purchased Contingency Reserve services from MISO allow Big Rivers to mitigate or avoid the materially substantial NERC penalties which would apply if Big Rivers, without its MISO membership, i.e., on a standalone basis, should be found in violation of NERC's Contingency Reserve requirements.

Big Rivers sold only 82.6% of its available generation in 2009 following the termination of the lease of its power plants and prior to MISO membership. Big Rivers sold 87.6% of its available generation in 2010 operating only partially integrated into MISO. Big Rivers sold 90.3%, 81.3%, and 87.5% of its available generation in, 2011, 2012 and 2013, respectively, operating fully integrated into MISO. In 2014 and 2015, Big Rivers sold 94.8% and 84.1% of its available generation, respectively, excluding Reid 1 from the calculation.¹ Big Rivers has been able to sell all its excess generation that clears the energy market price versus Big Rivers' opportunity prior to MISO membership to sell generation in blocks during on-peak and off-peak time periods to other utilities/entities together with some sales into the MISO energy market on a day-ahead or real-time basis.

¹ Reid 1 was idled in 2016, and rarely dispatched in 2014 and 2015. Hence, the dispatch percentage of Reid 1 is excluded from the calculation for 2014 and 2015 so as not to skew the result.

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

Big Rivers has continued to experience minimal adverse effects from transmission congestion at the Big Rivers transmission system border since joining MISO. While it is difficult to quantify the financial benefit recognized by Big Rivers, the market re-dispatch of generation by MISO to manage transmission congestion has had a positive effect on Big Rivers' ability to both purchase power from and sell power to MISO. During the period from 2007 to 2009, Big Rivers experienced curtailments in power purchases or power sales on at least fifty occasions due to transmission constraints outside of the Big Rivers transmission system. However, since joining MISO, Big Rivers has experienced virtually no deliverability related limitations, other than those experienced by Century as part of the special protective relay system Century completed as a result of the idling of Coleman Station. Thus, MISO membership has continued to be a notable benefit for Big Rivers in terms of favorable transmission operational experiences.

In the CRA Analysis, it was estimated that the MISO administrative charges would be \$5.3 million in 2011 and \$4.8 million in 2012. The actual MISO charges were \$4.7 million in 2011, \$5.2 million in 2012, \$5.0 million in 2013, \$2.2 million in 2014, and \$2.3 million in 2015. The projected MISO charges for 2016 are \$2.4 million.

As Big Rivers has gained additional experience operating in the MISO market, Big Rivers has also realized that additional costs exist to serve member load that were not quantified prior to joining MISO. Due to the workings of the MISO market, Big Rivers sells all available generation to MISO and then buys the power needed to serve all its members' load from MISO. Due to congestion and loss charges, there is a fluctuating price differential between the Locational Marginal Price ("LMP") Big Rivers is paid for power it

**Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043**

Prepared September 2016

sells to MISO and the LMP charged by MISO for power needed to serve Big Rivers' load. Financial Transmission Rights ("FTRs") can provide a hedging mechanism to offset the congestion cost embedded in the LMP; however, Big Rivers has discovered, through market participation, that losses embedded in the LMP are not hedged in the MISO market. Excess loss collections are refunded to market participants, but the refunds are only a fraction of the total cost differential experienced in MISO. Big Rivers continues to evaluate and monitor these costs.

In the CRA Analysis, it was assumed that Big Rivers would have to add staff to meet the additional workload demands associated with operation in the MISO market. Big Rivers now believes that through careful planning and job redesign, it has been able to permanently avoid the staffing additions deemed necessary by CRA. Big Rivers' annual costs in 2014 were less than \$150,000 versus the estimated \$800,000 cost associated with the internal staffing and equipment additions assumed in the CRA Analysis.

Conclusion

As stated previously, continued MISO membership is currently the most cost-effective option for meeting Big Rivers' NERC-mandated Contingency Reserve requirement. The benefit derived by Big Rivers from MISO membership has continued to be greater than was estimated in the CRA Analysis because:

- (1) Big Rivers' cost under the stand-alone plan has increased since Big Rivers no longer believes that 200 MW of the smelter load can be assumed to be used as interruptible load to fulfill some of the Contingency Reserve requirement;

Midcontinent Independent System Operator
Annual Cost/Benefit Update for Kentucky Public Service Commission
Per Finding No. 2 of Commission's November 1, 2010 Order, Case No. 2010-00043

Prepared September 2016

- (2) additional internal staffing and equipment costs have been less than anticipated thus far;
- (3) the MTEP/MVP cost allocations to Big Rivers have currently been eliminated by smelter contract terminations and cancellation of MISO to Tennessee Valley Authority ("TVA") transmission service;² and
- (4) Big Rivers has realized a benefit from the ability to sell more power into the market than was the case prior to our MISO membership due in part to our ability to purchase Contingency Reserve services from MISO and due to the virtual elimination of transmission constraints.

Clearly, in the near-term, membership in MISO remains Big Rivers' best option, but Big Rivers will continue to closely evaluate this as well as other options for meeting its Contingency Reserve requirement and monitor costs, benefits, and implications of continued future MISO membership. An annual cost/benefit analysis will continue to be performed and supplied to the Commission as required in the approval order.



Michael W. Chambliss
Vice President System Operations
Big Rivers Electric Corporation

² In 2014, Big Rivers was assessed for MTEP and MVP projects. The MVP cost allocations were assessed on transmission reservations for service to Big Rivers' non-grandfathered agreement member load (i.e., both aluminum smelters). On a going-forward basis, as a result of the smelter contract terminations and the termination of the MISO to TVA transmission reservation, Big Rivers will no longer receive MTEP and MVP cost allocations.