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VIA ELECTRONIC FILING

Honorable Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First St., N.E.  
Washington, D.C. 20426

RECEIVED  
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COMMISSION

**Re: Midcontinent Independent System Operator, Inc.  
System Support Resources Agreement with Big Rivers Electric  
Cooperative; Docket No. ER14 - \_\_\_\_ -000**

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act ("FPA"), 16 U.S.C. § 824d and Part 35 of the Federal Energy Regulatory Commission's ("FERC" or "Commission") regulations, 18 C.F.R. § 35, *et. seq.*, the Midcontinent Independent System Operator, Inc. ("MISO") respectfully submits to FERC for approval a System Support Resource ("SSR") Agreement by and between Big Rivers Electric Cooperative ("Big Rivers") and MISO. The SSR Agreement submitted herewith generally conforms to the *pro forma* agreement in Attachment Y-1 of MISO's Open Access Transmission, Energy and Operating Reserve Markets Tariff ("Tariff").<sup>1</sup>

**I. BACKGROUND**

The SSR Tariff provisions permit MISO to negotiate compensation for selected Generation Resources<sup>2</sup> where a Market Participant desires to retire or suspend operation of a facility but MISO determines that the facility is needed to maintain system reliability.<sup>3</sup> Market Participants must submit an Attachment Y Notice to MISO at least 26 weeks in advance of any plan to retire or suspend operation of a generation unit or a Synchronous Condenser Unit. Based upon information submitted by the Market Participant, and MISO's knowledge of grid conditions, MISO will determine if the facility should be designated as an SSR Unit. Upon such

<sup>1</sup> On September 21, 2012, the Commission conditionally approved amendments to the SSR provisions in the Tariff to become effective on September 24, 2012, subject to compliance filings. *See Midwest Indep. Transmission Sys. Operator, Inc.*, 140 FERC ¶ 61,237 (2012) ("SSR Order"); *see also Compliance Filing of the Midwest Indep. Transmission Sys. Operator, Inc.*, FERC eLibrary Accession No. 20121218-5147, Docket No. ER12-2302 (filed Dec. 18, 2012).

designation, MISO will enter into agreements with Market Participants that own or operate an SSR Unit to allow for recovery of certain going-forward costs, offset by any expected payments for resource adequacy and net revenues from energy market transactions. The costs pursuant to an SSR Agreement generally are assigned to the entities serving load in the affected control areas (*i.e.*, Load Serving Entities or "LSEs").<sup>4</sup>

Big Rivers owns the Coleman facilities located near Hawesville, Kentucky in the northern portion of that state. These facilities include four generating units, the first three of which provide 443 MW of capacity that are the subject of this submission. Coleman has coal-fired steam boilers that were installed in the 1969-1971 period. On December 19, 2012, Big Rivers submitted an Attachment Y-2 (Request for Non-Binding Study Regarding Potential SSR Status) to MISO in order to assess the potential suspension of Coleman Units 1-3, beginning on August 20, 2013 and resuming operations January 1, 2015. MISO completed its analysis of the Attachment Y-2 request, identifying reliability issues associated with the suspension of these units, and MISO provided a response to Big Rivers on May 2, 2013. The MISO Tariff permits the Market Participant to submit an Attachment Y Notice following an Attachment Y-2 that requests a change in status 26 weeks from the date of the original Attachment Y-2 request. On May 24, 2013, Big Rivers submitted a letter to MISO indicating its desire to suspend Coleman for a period of twenty-eight months, and included an Attachment Y Notice that designated September 1, 2013 as the beginning for the suspension.

MISO completed its analysis of the Attachment Y Notice and Mr. Jeffrey R. Webb, MISO's Senior Director of Expansion Planning, notified Big Rivers that Coleman would be designated an SSR Unit until such time as appropriate alternatives could be implemented to mitigate reliability issues. MISO concluded that the proposed suspension of Coleman during the twenty-eight month suspension period, without curtailment of load by means of demand response, would result in violations of specific applicable reliability standards. As a result, MISO designated Coleman as an SSR Unit until such time as appropriate alternatives can be implemented to mitigate reliability issues.

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<sup>2</sup> Capitalized terms not otherwise defined herein have the meanings ascribed thereto in Section 1 of the Tariff.

<sup>3</sup> See generally SSR Order at PP 2-4 (discussing the approval of the SSR provisions).

<sup>4</sup> See Section 38.2.7.k of the Tariff (formerly Section 38.2.7.j).

MISO began working with Big Rivers and the MISO Independent Market Monitor (“IMM”) to negotiate and develop an appropriate SSR Agreement. Big Rivers submitted a draft SSR Agreement for MISO’s consideration, and Big Rivers proposed a twelve (12) month SSR Agreement for the period between September 1, 2013 and August 31, 2014. Big Rivers has voluntarily continued operating Coleman through the present time.

## **II. KEY ELEMENTS OF THE SSR AGREEMENT**

MISO submits the enclosed SSR Agreement to the Commission for approval as a just and reasonable agreement to ensure Transmission System reliability in the MISO Region. The SSR Order required, among other things, that MISO: (1) submit an SSR Agreement for Commission approval; (2) provide a description of alternatives that were evaluated; (3) discuss the estimated earliest termination date for the SSR Agreement; and (4) explain how MISO would ensure grid reliability once the SSR Unit retires.<sup>5</sup> As discussed herein, the SSR Agreement maintains the reliability of the MISO system and, as the Tariff requires, provides for equitable compensation for the SSR Unit’s continued availability.

### **A. Proposed Modifications to the Attachment Y-1 Form Agreement**

As discussed herein, there are “novel legal issues or other unique factors” that justify departures from the *pro forma* SSR agreement<sup>6</sup> and that are consistent with Commission precedent. Specifically, MISO proposes several modifications in the enclosed SSR Agreement to the form agreement found in MISO compliance filing in late 2012 that proposed slight modifications to the Attachment Y-1 found in MISO’s Tariff,<sup>7</sup> including:

(1) “MISO” is used throughout the Agreement to designate the current name for the Midcontinent Independent System Operator;

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<sup>5</sup> SSR Order at P 10.

<sup>6</sup> See *Midwest Indep. Transmission Sys. Operator, Inc.*, 142 FERC ¶ 61,170 (2013) (granting MISO the authority to depart from the Attachment Y-1 *pro forma* SSR Agreement); see also *New York Indep. Sys. Operator*, 139 FERC ¶ 61,180 (2012); *Pacific Gas and Electric Co.*, 128 FERC 61,175 (2009) (“The Commission recognizes that allowing non-conforming agreements may result in interconnection customers being treated differently, but nonetheless finds it to be necessary in certain situations.”); see e.g., *Midwest Indep. Transmission Sys. Operator*, 131 FERC 61,199, 62 (2010) (accepting non-conforming interconnection agreement is necessary to allow entities to retain the distinct status afforded to them by Minnesota law); *Florida Power & Light Co.*, 118 FERC ¶ 61,176 (2007) (permitting departure from *pro forma* indemnification provision in LGIA); *Midwest Indep. Transmission Sys. Operator*, 112 FERC 61,270 (2005) (granting departures from *pro forma* LGIA “because of the ownership structure of the wind generating facilities.”).

<sup>7</sup> *Compliance Filing of the Midwest Indep. Transmission Sys. Operator, Inc.*, FERC eLibrary Accession No. 20121218-5147, Docket No. ER12-2302 (filed Dec. 18, 2012). The compliance filing is the basis for the redlined SSR Agreement. See Exhibit C.

(2) Section 3.A(3) has been modified to provide for “at least sixty (60) days” notice of termination to reflect MISO’s intent to provide advance notice to Big Rivers, but for a shortened period from the *pro forma* “ninety (90) days” in order to better permit an alternative to SSR service to be implemented. Section 3.B also reflects the scenario by which an alternative to the SSR Agreement (a SPS scheme, as discussed below) is developed and Big Rivers requests termination of the SSR Agreement (which can also be partial, as provided in Section 3.C);

(3) Abbreviations for the Federal Energy Regulatory Commission, “FERC” and “Commission,” are added for clarification to Section 3.B (an abbreviation is extensively used in Section 9 of the SSR Agreement);

(4) Section 3.D recognizes that two-hour advance notice that is provided for under Section 7.A(2) of the *pro forma* agreement cannot be practically provided in writing;

(5) Section 4.A(1) identifies the jurisdiction in which Big Rivers is authorized to do business (i.e. the “Commonwealth of Kentucky”);

(6) Section 4.A(5) and (6) use the lower case for “prior agreement,” recognizing that the term is not set out for special definition in either the SSR Agreement or MISO’s Tariff;

(7) Section 4.A(9) defines the term “Bankrupt” using terms from MISO’s Tariff;

(8) Section 7.A(1) clarifies that a capacity test does not include a “ramp-up period” that would reduce the test value for a generating unit;

(9) Section 7.C(3) contains a change from “purchase” to “dispatch” to more precisely describe the action taken by MISO towards the SSR Unit;

(10) A new provision has been added as Section 7.D, clarifying that the SSR Unit will be subject to the Module E-1 capacity testing requirements that became effective on October 1, 2012, which are not included in the *pro forma* SSR Agreement.<sup>8</sup> The Module E-1 capacity testing requirements will not preempt the approved Capacity Tests in Section 7.A of the Agreement;

(11) A new provision has been added as Section 7.E, stating that MISO and Big Rivers will coordinate their schedules to permit Big Rivers to undergo both testing for capacity and for other requirements (such as for “environmental and insurance requirements”);

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<sup>8</sup> On June 11, 2012, the Commission conditionally approved MISO’s new Module E-1 Tariff language, to become effective on October 1, 2012. See *Midwest Indep. Transmission Sys. Operator, Inc.*, 139 FERC ¶ 61,199 (2012).

(12) The Operation provisions in Section 8 have been revised to clarify maintenance, planning data, and delivery obligations to be consistent with other Tariff provisions.<sup>9</sup> Section 8 contains certain changes necessary to align the SSR Agreement with the current structure of the MISO markets and the date upon which the SSR Agreement was finalized for filing. Section 8.A. clarifies that Participant shall follow MISO's outage scheduling system and that MISO shall approve or reject Generator Planned Outages in accordance with MISO's Business Practices Manuals. Section 8.B clarifies Participant's obligations to notify MISO of the availability of the SSR Unit. Section 8.C clarifies that MISO shall notify Big Rivers of the hours and levels, if any, that the SSR Unit is to operate through day-ahead commitment and real-time dispatch for system reliability. Section 8.C further clarifies that the set point in the real-time dispatch shall be considered the "Delivery Plan" for the purposes of the SSR Agreement. These changes ensure that MISO and Big Rivers have a common understanding of how the SSR Unit is to be made available to MISO for system reliability and the SSR Unit may be otherwise operated. Section 8.C also clarifies that all Offers from the SSR Unit during the term of the SSR Agreement shall be cost-based;

(13) The responsibilities for providing information regarding Operational Limitations is placed on the incorrect party in Section 8.B(3), and that matter is corrected in conformance with the general obligations on the Participant in Section 8.B and regarding the Environmental Limitations that are partly the topic of Section 8.B(3);

(14) The Payment Provisions in Section 9 are modified to reflect MISO Settlement provisions and the terms/conditions of Exhibit 2;<sup>10</sup>

(15) Section 9.D(3) has been modified to clarify that the SSR Agreement is entered into to ensure the reliability of the "MISO Transmission System," as that term is defined in Section 1.677 of the MISO Tariff;

(16) Section 9.D(4) has been modified to clarify that the ceiling on lowering payments to Big Rivers as the result of a Misconduct Event applies to all Coleman units subject to the SSR Agreement;

(17) Section 9.D(7) has been added to clarify that SSR payments are reduced if the Tested Capacity falls sort of the SSR Capacity (defined in Section 1.E) and if the SSR Unit does not fully respond to MISO dispatches under circumstances where the reductions are unexcused. Since Billing Capacity is only reduced under certain circumstances, specified in Section 9.D(7),

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<sup>9</sup> Section 38.2.5.g of MISO's Tariff requires that all Market Participants coordinate their Generator Planned Outage schedules with MISO, which occur through MISO's CROW procedures.

<sup>10</sup> Attachment Y-1 did not include Tariff details regarding cost recovery provisions when it was originally drafted, which are included in Exhibit 2 as required by the SSR Order. *See* SSR Order at P 140.

the term “may be reduced” is used in Section 7.C regarding the effect of a capacity test on Billing Capacity;

(18) New provisions were added to Section 9.E to address compensation for unanticipated repairs. This section provides an equitable mechanism for Big Rivers to receive cost recovery for unanticipated repairs required to maintain system reliability. Section 9.E also provides that MISO will make a Section 205 filing before any such unanticipated repair costs are incurred by Big Rivers, except in the case of certain emergency repairs. These provisions protect MISO and LSEs by requiring a Section 205 filing before non-emergency unanticipated repair costs are incurred, at which point the Commission would determine the necessity of allocating the unanticipated repairs costs to LSEs pursuant to Schedule 43F;<sup>11</sup>

(19) Section 9.F was included to reference to the allocation of SSR Agreement costs to LSEs that benefit from the operation of the subject SSR Unit, in accordance with MISO Schedule 43F, which is being filed concurrently;

(20) Good Utility Practice, as that term is used in MISO’s Tariff, is inserted into Section 10 to further explain the obligations to restore conditions to those contemplated by the SSR agreement following any material breach of the SSR Agreement;

(21) Section 13.A contains references to Indiana as the choice in law (the location of MISO’s headquarters), made consistent with the provision in Section 11.A regarding monetary damages as provided for under Indiana law;

(22) Section 13.B(1)(c) provides for notification to the other party under circumstances where collateral financing is arranged, but that notification comes from the assigning party as opposed to a third party since Big Rivers’ financial instruments do not normally include such provisions regarding third parties. This Section also includes a parenthetical definition of “Financing Person,” a defined term that is later used in this same section of the *pro forma* agreement;

(23) Section 13.C through 13.P are re-lettered for clarity and readability purposes; and

(24) Exhibit 2 was drafted to provide a description of how Big Rivers will be compensated for the fixed component of costs and the variable component for instances where MISO dispatches Big Rivers for system reliability purposes. Reference is made to the applicable Tariff Settlement provisions. Sections 9 has been adjusted to correspond to the compensation and settlement provisions arrived at by MISO and Big Rivers.

The proposed modifications are also generally consistent with the enhancements that were conditionally approved by the Commission in the SSR Order, and are just and reasonable given the subject SSR Unit.

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<sup>11</sup> See SSR Order at P 139.

## **B. Review of Feasible Alternatives**

The SSR Agreement is being filed pursuant to Section 38.2.7 and Attachment Y-1 of the Tariff that (among other matters) require MISO to “assess feasible alternatives”<sup>12</sup> to entering into an SSR Agreement. MISO has assessed available feasible alternatives to entering into the SSR Agreement, as described in more detail in the enclosed Exhibit B (Attachment Y Study Report).<sup>13</sup> These assessments cover the topics of new generation or generation dispatch, system reconfiguration and operation guidelines, demand response, and transmission projects.<sup>14</sup>

Following the Attachment Y determination, MISO evaluated potential mitigation measures (further discussed in the following section) to address the thermal and voltage issues resulting from the Coleman suspension. Limited generation in the area was already committed and did not provide feasible redispatch solutions to alleviate the voltage and thermal issues. Existing operating guides and transmission reconfiguration options do not address the voltage or thermal loading issues, and create further issues for the next contingency. Transmission upgrades could not be implemented within the timeframe for the suspension period. Analysis of demand response was conducted to determine the effectiveness of load shedding for the nearby industrial customer, and a number of further discussions were conducted with Century Aluminum to evaluate possible plans to develop a load curtailment option.

## **C. Review of Feasible Alternatives with Stakeholders**

The Attachment Y Study report states the alternatives to the SSR Agreement that were reviewed. Since Coleman is a suspension, transmission upgrades will not be in place before the expected return of Coleman to service. Order 890 and recent FERC orders related to MISO’s

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<sup>12</sup> Section 38.2.7.c of the Tariff.

<sup>13</sup> SSR Order at P 80; *see* Exhibit B, Attachment Y Study Report at 10-12 (providing: (i) a general description of the types of transmission switching operations and specific operating procedures that MISO has developed to mitigate System Operating Limit violations in the operational timeframe (Section VII.b); (ii) a description of the specific transmission switching operations and operating procedures that MISO evaluated in relation to this proceeding (Sections VII.a and V.b); and (iii) why each evaluated transmission switching operation or operating procedure was determined not to be a feasible alternative (Section VII)). MISO includes a similar, three-part analysis for the other categories of potential alternatives to an SSR Agreement considered (*e.g.*, redispatch/reconfiguration through operating procedures, remedial action schemes, and demand response) and combinations of those options (Section VII).

<sup>14</sup> See Exhibit B, Attachment Y Study Report at 12-13.

SSR filings require MISO to carefully consider transmission, generation, and demand response alternatives to address the local reliability issue.<sup>15</sup>

The SSR status of Coleman is expected to continue until load curtailment arrangements by means of demand response from Century Aluminum, a smelter in the area near Coleman, are in place to adequately address possible transmission system overloads. The Attachment Y Study Report (attached Exhibit B) further discusses this alternative.

The demand-side management and special protective scheme alternatives that have undergone discussion with Century Aluminum were discussed at a Central Transmission System Task Force stakeholder conference on July 25, 2013. No significant feedback was received from the participants (approximately a dozen participants) on (1) redispatch or reconfiguration; (2) other remedial action plans or special protection schemes; (3) other demand response or generation alternatives; or (4) any other alternatives.

MISO and Century Aluminum engaged in several meetings and conference calls to develop a plan to allow the industrial load to be curtailed for reliability issues that resulted from the unplanned system conditions. In those discussions, MISO and Century Aluminum considered operating procedures that would permit manual load curtailment actions. These discussions were discontinued since the requirements proved too restrictive to the customer.

Century Aluminum proposed, and began designing, a special protection scheme (“SPS”) that would allow more flexibility to shed load automatically by employing relay equipment to monitor conditions and trip blocks of plant load to reduce loading on the transmission facilities. Century Aluminum continues to coordinate the development of the relay scheme with the Transmission Owners and MISO in order to complete the design, but has not yet finalized the

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<sup>15</sup> See SSR Order at P 10 (requiring the consideration of alternatives to SSR Agreements); see also *Midwest Indep. Transmission Sys. Operator, Inc.*, 142 FERC ¶ 61,215, at PP 29, 41 (2013) (stating in an Order on Order No. 1000 Compliance Filings and Tariff Revisions that: “[a] primary objective of the reforms in Order No. 1000 is to ensure that transmission planning processes at the regional level consider and evaluate, on a nondiscriminatory basis, possible transmission alternatives and produce a transmission plan that can meet a transmission planning region’s needs more efficiently and cost-effectively” (citing *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, FERC Stats. & Regs. ¶ 31,323 at PP 4, 6 (2011), *order on reh’g*, Order No. 1000-A, 139 FERC ¶ 61,132, *order on reh’g*, Order No. 1000-B, 141 FERC ¶ 61,044 (2012)) and “when evaluating the merits of alternative transmission solutions, proposed non-transmission alternatives must be considered on a comparable basis” (citing Order No. 1000 at P 148)); see generally *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, FERC Stats. & Regs. ¶ 31,241, *order on reh’g*, Order No. 890-A, FERC Stats. & Regs. ¶ 31,261 (2007), *order on reh’g*, Order No. 890-B, 123 FERC ¶ 61,299 (2008), *order on reh’g*, Order No. 890-C, 126 FERC ¶ 61,228, *order on clarification*, Order No. 890-D, 129 FERC ¶ 61,126 (2009).



work. Once the design has been approved and implemented, MISO would allow the SPS to provide the necessary load reductions to address the issues and allow the Coleman plant to suspend operations. The SSR Agreement accommodates this development where it provides, in Section 3.A(3), for termination upon sixty days written notice instead of the 90 days provided in the *pro forma* agreement in order to more rapidly change to using the SPS as a substitute for Coleman's SSR status.<sup>16</sup>

#### **D. Likely Timing for SSR Agreement Termination**

The SSR Order requires that MISO report on its estimate of how long the SSR Agreement will need to remain in effect,<sup>17</sup> and also directs MISO to modify the Attachment Y-1 *pro forma* SSR Agreement to include language that an SSR Agreement must not exceed a one-year term, except in exigent circumstances.<sup>18</sup> Although the SSR Agreement would normally be required for the entirety of the suspension period proposed by Big Rivers for Coleman, the SPS measures discussed above may eliminate the need for the SSR designation for Coleman. Therefore, MISO intends to continue to monitor the SPS developments such that the SSR designation is a last resort measure to maintain Transmission System reliability.

Moreover, pursuant to Section 38.2.7.1 of the Tariff,<sup>19</sup> MISO shall annually review the SSR Unit and grid characteristics to determine whether the SSR Unit is qualified to remain as an SSR Unit. Additionally, under both the Tariff and the *pro forma* Attachment Y-1 SSR Agreement, MISO retains the right to terminate this SSR Agreement prior to the end of the Term by giving written notice to the Participant. As discussed above, the *pro forma* provision for ninety days written notice has been modified in the SSR Agreement to provide sixty days. This modification should provide a better opportunity to switch to SPS operation to render the SSR Agreement unnecessary. In accordance with Section 38.2.7e<sup>20</sup> of the Tariff, the proposed term of the SSR Agreement is twelve months.

#### **E. How MISO Will Maintain System Reliability After the SSR Agreement Terminates**

As described in the Attachment Y Study Report, alternatives to the SSR Agreement were reviewed in light of submission by Big Rivers of a request to Suspend operations at Coleman. Transmission upgrades will not be in place before the return of Coleman to service, and therefore transmission upgrades are not planned for service after the SSR Agreement terminates. Such termination could occur before the end date for the suspension if load curtailment arrangements are in place to adequately address possible transmission system overloads.

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<sup>16</sup> Sixty days was selected in order to conform to the Commission's termination requirements, 18 C.F.R. § 35.15 (2013).

<sup>17</sup> SSR Order at PP 134-135.

<sup>18</sup> *Id.* at P 106.

<sup>19</sup> *See also* former Section 38.2.7.j of the Tariff.

<sup>20</sup> *See also* former Section 38.2.7.d of the Tariff.

#### F. Proposed Effective Date of SSR Agreement

As discussed in the contemporaneously filed transmittal letter for Schedule 43F, MISO requests a September 1, 2013 effective date for the SSR Agreement as well as for Schedule 43F. Big Rivers' Attachment Y Notice to MISO, dated May 24, 2013, requested to suspend Coleman on September 1, 2013. MISO completed its reliability analysis and deemed the Coleman required for reliability notified Big Rivers that the subject facilities qualified to become an SSR Unit. As required by the Tariff, MISO and Big Rivers entered into good faith negotiations over the proper compensation to include in the SSR Agreement. Through the present date, Big Rivers has maintained the availability of the subject SSR Unit (*i.e.* Units 1-3 remained available to maintain system reliability) pursuant to MISO's request, and Big Rivers incurred costs that would otherwise be covered by the rate contained in the SSR Agreement. The SSR agreement and the associated Schedule 43F are being submitted as soon as possible following the complexities involved in working through the notification, evaluation, decision-making, and negotiation process, including those related to working through a demand response alternative to designating Coleman as an SSR Unit.

MISO respectfully requests that the September 1, 2013 effective date be granted either through waiver of the prior notice rule or by treating the SSR Agreement as a late-filed service agreement. Good cause exists to grant the waiver of the prior notice rule. The delay in filing the SSR Agreement was a consequence, in part, of the fact that negotiation of the SSR Agreement could not be completed by the requested effective date, but the Tariff required the SSR Units to remain available. Notwithstanding this delay, Big Rivers has maintained its SSR Unit and ensured that it was available to maintain reliability.

The waiver is also required to permit MISO to comply with its Tariff and Commission precedent on the SSR program. Section 38.2.7 of the Tariff provides that SSR Units are due "equitable compensation" in exchange for maintaining availability past its required shut-down date, in this case, September 1, 2013. Moreover, in approving the SSR program, the Commission explained that the SSR Units should be "fully compensated" and that "nothing in the SSR program would require a generator to absorb any uncompensated going-forward costs."<sup>21</sup> If the September 1, 2013 effective date is not granted for the SSR Agreement and Rate Schedule 43F, then Big Rivers will have provided SSR service on an uncompensated basis while the required Tariff process took its course. This would be an inequitable outcome, and one that would seem to violate both the Tariff and Commission precedent.

To the extent that the Commission believes that waiver of prior notice is not appropriate, MISO respectfully requests that the Commission treat the SSR Agreement as a late-filed service agreement, limiting Big Rivers' revenue recovery to variable operations and maintenance costs

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<sup>21</sup> See also *Midwest Indep. Transmission Sys. Operator, Inc.*, 109 FERC ¶ 61,157, at P 293 (2004) ("Finally, we emphasize that all SSR units should be fully compensated for any costs incurred because of their extended service. For example, nothing in the SSR program would require a generator to absorb any uncompensated going-forward costs.").

from September 1, 2013 to October 2, 2013, the latter date being that which the SSR Agreement and Rate Schedule 43F would be effective under the 30-day rule for service agreements, so that Big Rivers would not be required to provide this reliability service at a loss.<sup>22</sup>

In the alternative, to the extent the Commission does not grant the requested September 1, 2012 effective date, MISO requests an effective date of October 2, 2013, consistent with the Commission's rule that service agreements must be filed within 30 days of commencing service.<sup>23</sup> The SSR Agreement is a *pro forma* agreement included in the Tariff, the executed versions of which are therefore service agreements.

For the foregoing reasons, MISO respectfully requests that the Commission waive its sixty (60) day notice requirement, as specified in Section 35.3(a) of the Commission's regulations, 18 C.F.R. § 35.3(a), and make the SSR Agreement effective as of September 1, 2013. To the extent that the Commission determines that any requirement of 18 C.F.R. § 35 apply that have not been specifically addressed herein, MISO respectfully requests waiver of such requirements.

#### **G. SSR Cost Determination**

Consistent with SSR Order,<sup>24</sup> MISO has negotiated in good faith with Big Rivers to develop just and reasonable rates to compensate Big Rivers for operating the SSR Unit. The enclosed Direct Testimony of Robert W. Berry, enclosed as Exhibit E, supports such proposed rates.<sup>25</sup> The compensation provided to Big Rivers for its SSR Unit status is just and reasonable and is no more than necessary to maintain the availability of the SSR Unit for such time as needed to maintain reliability.<sup>26</sup> The IMM and MISO have reviewed the financial operating cost information provided by Big Rivers for Coleman and have agreed to a negotiated monthly amount of \$3,414,502 as equitable compensation for maintaining three Coleman units in

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<sup>22</sup> Under the Commission's policy for late-filed agreements, sellers are still permitted to recover their variable Operating and Maintenance costs so that they are not required to operate at a loss. *See Int'l Transmission Co.*, 140 FERC ¶ 61,151, at P 26 (2012) ("As noted by ITC, the Commission's time-value refund policy for late-filed agreements does not require the utility to operate at a loss; therefore, if the utility is only recovering its out-of-pocket costs incurred to provide the service, there is no requirement to make time-value refunds.").

<sup>23</sup> Under the Commission's regulations, public utilities may adopt standard form service agreements which are included as part of the utility's tariff on file with the Commission. 18 C.F.R. § 35.10a(a). The Commission's regulations further provide that service agreements (defined at 18 C.F.R. § 35.2 as "an agreement that authorizes a customer to take electric service under the terms of a tariff") need only be filed within thirty days after service has commenced. 18 C.F.R. § 35.3(a)(2).

<sup>24</sup> SSR Order at P 140.

<sup>25</sup> Exhibit E, Robert W. Barry Testimony at 5.

<sup>26</sup> *Id.*

operational status.<sup>27</sup> While Big Rivers maintains that a higher level of cost recovery would be justified under the Tariff, Big Rivers has agreed to the negotiated rate contained in the SSR Agreement for the purposes of timely regulatory approval and certainty.

The SSR Agreement for Coleman provides for variable generation costs when MISO dispatches the SSR Unit to maintain system reliability. The SSR Agreement also contains equitable mechanisms to ensure that when the SSR Unit is dispatched, Big Rivers will not receive market revenues above variable generation costs.

In contrast to other reliability must-run contracts filed at the Commission, the SSR Agreement does not represent a “fully loaded” cost-of-service rate. The rates do not include, for example, a rate of return on rate base, depreciation, or other cost components of a full cost-based rate.

Moreover, the termination clause of the SSR Agreement will permit MISO to terminate the agreement on 60 days’ notice in MISO’s sole discretion, so customers will not have to pay the subject SSR costs for any longer than necessary to ensure system reliability.

#### **H. SSR Cost Recovery**

The Tariff requires that the costs associated with the subject SSR Agreement will be allocated to all LSEs that benefit from the operation of the SSR Unit, as proposed in the new Rate Schedule 43F. The allocation is consistent with revised Section 38.2.7.k of the Tariff (which the Commission conditionally approved in Docket No. ER12-2302<sup>28</sup>) to allocate costs pursuant to the SSR Agreement to the LSEs that require the operation of the SSR Unit for reliability purposes. Consistent with the SSR Order,<sup>29</sup> MISO is contemporaneously submitting a new Rate Schedule 43F in a separate FERC filing to address cost recovery of the subject SSR costs.<sup>30</sup>

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<sup>27</sup> Exhibit 2 to the SSR Agreement states a lower level of \$2,250,936 for the Monthly SSR Payment if only Coleman Units 2 and 3 are required in the future to deal with reliability concerns. The Coleman generating units have some common costs, a matter that is dealt with in providing a second level of monthly compensation.

<sup>28</sup> SSR Order at P 153; *see also* former Section 38.2.7.j of the Tariff.

<sup>29</sup> SSR Order at P 155.

<sup>30</sup> MISO respectfully requests that the this filing and the related Rate Schedule 43F proceeding be consolidated, consistent with the Commission’s practice to consolidate matters where there are common issues of law or fact and consolidation will ultimately result in greater administrative efficiency. *See e.g., Sw. Power Pool, Inc.*, 125 FERC ¶ 61,001, at P 26 (2008); *Startrans IO L.L.C.*, 122 FERC ¶ 61,306, at P 64 (2008); *PP&L Resources, Inc.*, 90 FERC ¶ 61,203, at 61,653 (2000).

**III. DOCUMENTS SUBMITTED WITH THIS FILING**

The documents submitted with this filing include the following:

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|------------------------|---|-------------------------------------|
| Exhibit A              | - | Attachment Y Notice                 |
| Exhibit B – Non-Public | - | Attachment Y Study Report           |
| Exhibit B – Public     | - | Attachment Y Study Report           |
| Exhibit C              | - | Redline of SSR Agreement            |
| Exhibit D              | - | Clean version of SSR Agreement      |
| Exhibit E              | - | Direct Testimony of Robert W. Berry |

**IV. EFFECTIVE DATE**

MISO respectfully requests that the Commission waive its sixty (60) day notice requirement, as specified in Section 35.3(a) of the Commission's regulations, 18 C.F.R. § 35.3(a), and make this SSR Agreement effective as of September 1, 2013. To the extent that the Commission determines that any requirement of 18 C.F.R. § 35 apply that have not been specifically addressed herein, MISO respectfully requests waiver of such requirements.

**V. NOTICE AND SERVICE**

MISO has served a copy of this filing electronically, including attachments, upon all Tariff Customers under the Open Access Transmission, Energy and Operating Reserve Markets Tariff, MISO Members, Member representatives of Transmission Owners and Non-Transmission Owners, MISO's Advisory Committee participants, as well as all state commissions within the Region.

In addition, the filing has been posted electronically on MISO's website at <https://www.misoenergy.org/Library/FERCFilingsOrders/Pages/FERCFilings.aspx> for other interested parties in this matter.

**VI. COMMUNICATIONS**

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list established by the Secretary in this proceeding:

Jeffrey L. Small\*  
Matthew R. Dorsett\*  
Midcontinent Independent  
System Operator, Inc.  
P.O. Box 4202  
Carmel, Indiana 46082-4202  
Telephone: (317) 249-5400  
Fax: (317) 249-5912  
[jsmall@misoenergy.org](mailto:jsmall@misoenergy.org)  
[mdorsett@misoenergy.org](mailto:mdorsett@misoenergy.org)

\* Persons authorized to receive service

**VII. CONCLUSION**

For all of the foregoing reasons, MISO respectfully requests that the Commission accept the proposed SSR Agreement, grant the proposed effective date of September 1, 2012, and grant waiver of any Commission regulations not addressed herein that the Commission may deem applicable to this filing.

Sincerely,

/s/ Jeffrey L. Small  
Jeffrey L. Small  
Matthew R. Dorsett  
Midcontinent Independent System Operator,  
Inc.  
720 City Center Drive  
Carmel, Indiana 46032  
Telephone: (317) 249-5400  
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[mdorsett@misoenergy.org](mailto:mdorsett@misoenergy.org)

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201 Third Street  
P.O. Box 24  
Henderson, KY 42419-0024  
270-827-2561  
www.bigrivers.com

May 24, 2013

MISO  
ATTN: Director of Transmission Expansion Planning  
720 City Center Drive  
Carmel, IN 46032

Dear Sir or Madam,

Enclosed please find Big Rivers' Attachment Y Notification of Potential Generation Resource/SCU Change of Status. Please also note the supplemental information attached to the Attachment Y.

As discussed with MISO staff, Big Rivers is hereby submitting this Attachment Y, as a rollover of our Attachment Y-2 request, the results of which were communicated to us on May 2, 2013. Based on our December 19, 2012 submission of the Y-2 to MISO, our understanding is that we will have fulfilled the 26 week notification requirement of the Attachment Y as of June 19, 2013.

We appreciate your assistance in this matter. If you have any questions, please feel free to contact me at 270.844.6186.

Sincerely,

A handwritten signature in cursive script that reads 'Robert W. Berry'.

Robert W. Berry  
Chief Operating Officer  
Big Rivers Electric Corporation



## ATTACHMENT Y

### Notification of Potential Generation Resource/SCU Change of Status

This is a notification of potential change of Generation Resource or Synchronous Condenser Unit ("SCU") status in accordance with Section 38.2.7.a of the Tariff. An electronic copy of the completed form will be accepted by the Transmission Provider, however, a form will not be considered complete until the original form containing an original signature, including all attachments, is received by the Transmission Provider at the following address: Midwest ISO, Attention: Director of Transmission Planning; 720 City Center Drive, Carmel, IN 46032.

The Transmission Provider may request additional information as reasonably necessary to support operations under the Tariff.

Name of Market Participant owning and/or operating the Generation Resource or Synchronous Condenser Unit ("SCU")

Big Rivers Electric Corporation (BRPS)

Type of interest in Generation Resource or SCU:

Owner of Generation Resource/SCU

Operator of Generation Resource/SCU

Market Participant's state of organization or incorporation Kentucky

Generation Resource/SCU [plant and unit number(s)] Coleman Unit 1, BREC.COLE1

Coleman Unit 2, BREC.COLE2

Coleman Unit 3, BREC.COLE3

Market Participant has definitely decided and hereby certifies that it will [check one]

decommission and retire the Generation Resource/SCU commencing on \_\_\_ [day] of \_\_\_\_\_ [month] of \_\_\_\_\_ [year].

Suspend for economic reasons operation of the Generation Resource/SCU commencing on 1st [day] of September [month] of 2013 [year] and will resume operations on 1st [day] of January [month] of 2016 [year].

The Generation Resource/SCU is further described as follows:

Location: Coleman Generating Station

Unit Name: Coleman Unit 1 CPNode BREC.COLE1 Nameplate Capacity in MW: 150

Unit Name: Coleman Unit 2 CPNode BREC.COLE2 Nameplate Capacity in MW: 138

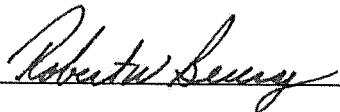
Unit Name: Coleman Unit 3 CPNode BREC.COLE3 Nameplate Capacity in MW: 155

Unit Name: \_\_\_\_\_ CPNode \_\_\_\_\_ Nameplate Capacity in MW: \_\_\_\_\_

Revenue Meter Location (Use Resource IDs): \_\_\_\_\_

Market Participant understands and agrees that this notification is binding as provided under Section 38.2.7 of the Transmission Provider's Tariff and will not be made public by the Transmission Provider except as provided for under Section 38.2.7(a) of the Tariff.

The undersigned certifies that he or she is an officer of the Market Participant that owns or operates the Generation Resource/SCU, that he or she is authorized to execute and submit this notification on behalf of Generation Resource/SCU, and that the statements contained herein are true and correct.

  
\_\_\_\_\_

Signature

Name: Robert W. Berry

Title: Chief Operating Officer

Date: May 24, 2013

STATE OF Kentucky

COUNTY OF Henderson

Before me, the undersigned authority, this day appeared Robert W. Berry, known by me to be the person whose name is subscribed to the foregoing instrument, who, after first being sworn by me deposed and said:

“I am an officer of Big Rivers Electric Corporation, I am authorized to execute and submit the foregoing notification on behalf of Big Rivers Electric Corporation, and the statements contained in such application are true and correct.”

SWORN TO AND SUBSCRIBED TO BEFORE ME, the undersigned authority on this the 24th day of May, 2013.

Paula Mitchell

Notary Public, State of Kentucky

My Commission expires 1-12-17



201 Third Street  
P.O. Box 24  
Henderson, KY 42419-0024  
270-827-2561  
www.bigrivers.com

May 24, 2013

Big Rivers is requesting to temporarily lay-up the Coleman Generating Station in an effort to reduce costs for its Members. The Attachment Y-2 Study for Coleman Station shows that the operation of Century's Hawesville Aluminum smelter, at current energy consumption levels, necessitates Coleman Station's continued operation. Big Rivers is working to accommodate the request of Century's Hawesville aluminum smelter to continue operations at the highest level possible, with the Coleman Station temporarily idled. MISO's assistance is requested to achieve this goal:

1. Big Rivers requests that MISO determine and authorize a Base Load amount of energy which may be delivered to Century with Coleman idled. After discussions with MISO staff, Siemens PTI has performed a study based on the Y2 report to determine this amount. The study is attached and Siemens' staff will be available to answer any questions.
2. Century will install capacitors as indicated in the study.
3. Century will propose to MISO, with Big Rivers' consent and cooperation, a manual protective relay program that will allow Century to operate at a Curtailable Load amount above the Base Load.
4. Big Rivers will enter into a SSR agreement for Coleman Station if required by MISO. The SSR will remain in effect until such time that MISO deems it no longer necessary. Century's intention is to avoid the need for an SSR agreement, thus Big Rivers is coordinating efforts to allow Century to make capacitor and protective relay installations, intended to eliminate the need for the SSR agreement.
5. If MISO determines that Coleman Station is required to be an SSR facility, Big Rivers and Century request MISO to determine the number of units at Coleman that will be required to satisfy the SSR condition.

Under the terms of our current power supply, these new arrangements must be in place by August 19th or electric service would terminate and the hundreds of employees at the Hawesville smelter would lose their jobs. We ask for your prompt attention to our requests.

## Memorandum

---

**Date:** May 21, 2013  
**To:** Michael Early  
**CC:** Nelson Bacalao, Jack Henry, Alicia Dortch  
**From:** John Hanson  
**RE:** Coleman Units 1, 2, & 3 MISO Y-2 Study

---

### Introduction

Big Rivers Electric Corporation submitted an Attachment Y-2, "Request for Non-Binding Study Regarding Potential SSR Status" to MISO for an informational study to evaluate the potential for Coleman Generation Units 1, 2, and 3 to be designated as SSR. The purpose of this study is to determine the reliability impacts that would occur if these units were to be removed from service on August 20, 2013 and returned to service on January 1, 2015. During this time, the study also addressed any reliability impacts for two scenarios: 1) Century Aluminum plant at Hawesville, Kentucky ceases operation on August 19, 2013 and 2) Century Aluminum continues normal operations.

Pursuant to a joint discussion among MISO, Big Rivers, Century Aluminum, and Siemens PTI it was recommended that Siemens PTI should coordinate with MISO to determine the amount of base load that can be served at the Hawesville plant with all of the Coleman generation removed from service.

### Study Objectives

Review the MISO Y-2 study and provide additional analysis outside of the Y-2 study scope to determine the maximum base load that can be served at the Century Aluminum Hawesville plant with all of the generation at Coleman out of service. This additional analysis will focus on any transmission circuit overloads and/or low voltages resulting from the Hawesville plant continuing normal operation with all of the Coleman Generation units removed from service.

---

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---

## Models and Assumptions

MISO supplied Siemens PTI with the following cases they created for the Y-2 study.

Table 1 MISO Y-2 Power Flow Study Cases

MISO Y2 Cases		Coleman	Century
1	Coleman 1,2,3 Y2 2014SP No Century Alum OFF.sav	OFF	OFF
2	Coleman 1,2,3 Y2 2014SP No Century Alum ON.sav	ON	OFF
3	Coleman 1,2,3 2014SP OFF.sav	OFF	ON
4	Coleman 1,2,3 2014SP ON.sav	ON	ON
5	Coleman 1,2,3 Y2 2017SH No Century Alum OFF.sav	OFF	OFF
6	Coleman 1,2,3 Y2 2017SH No Century Alum ON.sav	ON	OFF
7	Coleman 1,2,3 2017SH OFF.sav	OFF	ON
8	Coleman 1,2,3 2017SH ON.sav	ON	ON
9	Coleman 1,2,3 Y2 2017SP No Century Alum OFF.sav	OFF	OFF
10	Coleman 1,2,3 Y2 2017SP No Century Alum ON.sav	ON	OFF
11	Coleman 1,2,3 2017SP OFF.sav	OFF	ON
12	Coleman 1,2,3 2017SP ON.sav	ON	ON

Contingency files were requested but were not received. Therefore, Siemens PTI used the best available contingency files for this analysis. They included category A and B contingencies in BREC, MISO\_CENTRAL, TVA, PJM, and SERC areas derived from the MISO MTEP12 contingency files and automatic single contingencies. Only category A and B contingencies were considered because all transmission issues are required to be mitigated without load shedding. Siemens PTI can provide the contingency files upon request.

Siemens PTI used the Y-2 cases and the contingency files described above to run various scenarios in PSS@MUST to better understand the MISO Y-2 results since much of the needed information to evaluate the results was redacted from the MISO Y-2 Tables 1a and 1b.

Siemens PTI also used the cases to determine the maximum load that can be served with Coleman completely shut down (443MW) and Century Aluminum Hawesville in normal operation (485MW) for the 2014 Summer Peak, 2017 Shoulder, and 2017 Summer Peak cases. Siemens PTI used PSS@MUST AC FCITC calculations for transfers from METC or AMIL to the Hawesville load for this analysis. The transfer from METC was modeled after the cases developed by MISO. The transfer from AMIL was suggested as a source for Century to purchase the power once Coleman is retired. The results were virtually the same for either transfer choice so only one is detailed below. In Table 1, "OFF" indicates all generation at Coleman is off or all load at Century is off. "ON" indicates all generation at Coleman is on at full output or all load at Century in on for normal operation. Except for Hawesville, no BREC loads were changed for this analysis.

## Study Results

Siemens PTI will present their study results for issues inside of BREC and outside of BREC in separate sections of this report.

## BREC System Results

Siemens PTI reviewed the MISO Attachment Y-2 Study Report dated May 2, 2013. The results tabulated in the Y-2 attachment Tables 1a and 1b for branch loadings and voltages in the BREC system agree well with the results obtained by Siemens PTI. These results were determined by Siemens PTI using the MISO Y-2 cases. The contingency which most limited the imports to the Hawesville load is the 345kV line from Coleman to Davies. For this contingency, the most limiting element is the 161kV line from Coleman to Newtonville. Additionally this contingency caused numerous low voltages in the BREC system with the lowest voltages at the Coleman bus. Siemens PTI determined the maximum load which can be supplied to Century Aluminum Hawesville to limit the loading on this line to less than 100%. To address low voltage issues, Siemens PTI determined the amount of additional reactive compensation needed to support the voltage with Coleman removed from service. The results of this analysis are presented in Table 2 below.

Table 2 Maximum Century Load & Additional Capacitor Banks

Case	MISO Case Name	Max Century Load	Critical Contingency/Limiting Element	Additional Capacitor Banks
3	Coleman 1,2,3 2014SP OFF.sav	380 MW	345kV line from Coleman to Davies/161kV line from Coleman to Newtonville	200 MVAR
7	Coleman 1,2,3 2017SH OFF.sav	453 MW	345kV line from Coleman to Davies/161kV line from Coleman to Newtonville	200 MVAR
11	Coleman 1,2,3 2017SP OFF.sav	350 MW	345kV line from Coleman to Davies/161kV line from Coleman to Newtonville	200 MVAR

For each case, 200 MVAR will need to be added to the existing 93.6 MVAR capacitor bank installed at the Coleman bus. The new capacitors should be installed at or near the Coleman bus and be added in blocks of 100 MVAR or smaller sized banks to provide operational flexibility for different system conditions.

To allow the Century Aluminum Hawesville plant to operate at full load (485MW) for the critical contingency without having to upgrade lines to prevent thermal overload or install protective relays, some of the Coleman generation will need to be in service. For the three scenarios in Table 2, Coleman generation will need to be dispatched at the following levels:

2014SP	105MW
2017SH	32MW
2017SP	135MW

This level of generation could be achieved by placing one (the smallest unit) of the Coleman generators in service.

Note that there is a substantial increase in the maximum Century load which can be served with no Coleman generation in service for a modest decrease in the BREC load for the 2017SH case. The BREC load in the 2017SP case is 1661MW and the BREC load in the 2017SH case is 1475MW.

### External MISO System Results

As indicated above the Y-2 branch loading results inside the BREC system agreed well with the analysis performed by Siemens PTI. But, external to the BREC area the Y-2 reported numerous branch loading issues which were labeled as being associated with the Coleman generation and Hawesville load. For example, some of the worst branch loading issues were on 69kV lines in the DEI area. The results in Table 3 below were copied from Table 1a of the MISO Y-2.

Table 3 DEI Overloads from MISO Y-2 Result Tables

		Limiting Element				Coleman 1, 2, & 3 OFF			
Model	Contingency Description	** From bus ** ** To bus ** CKT	Type	Rating	Cont MV A	Base Flo w	Loading %	MISO Comments	
2014SPCentoff	[REDACTED CONTINGENCY]	249631 08THRNTN 230 991964 THORNTWN 1.00 1	TR	69.9	87.3	48.7	125.0	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250310 08BRINGH 69.0 250451 08FLORAJ 69.0 1	LN	34	37.4	3.0	110.0	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250321 08BURROW 69.0 250790 08ROCKFL 69.0 1	LN	34	47.6	8.1	139.9	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250441 08FFWSTJ 69.0 250457 08FRAK B 69.0 1	LN	100.3	112.0	57.8	111.7	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250451 08FLORAJ 69.0 250790 08ROCKFL 69.0 1	LN	34	43.6	4.5	128.2	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250457 08FRAK B 69.0 250883 08MIDLFO 69.0 1	LN	45	87.1	31.3	193.6	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250608 08KOK HP 69.0 250610 08KOHAI 69.0 1	LN	45	129.0	10.3	286.6	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250608 08KOK HP 69.0 250614 08KOSE 69.0 1	LN	65	69.7	44.0	107.2	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250610 08KOHAI 69.0 250798 08RUSIAV 69.0 1	LN	45	129.5	10.3	287.9	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250625 08LAF 69.0 250948 08WVMONI 69.0 1	LN	45	66.9	18.0	148.6	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250683 08MIDLFO 69.0 250795 08ROSSVL 69.0 1	LN	44	52.7	6.1	119.8	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250683 08MIDLFO 69.0 250798 08RUSIAV 69.0 1	LN	44	150.2	9.6	341.3	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250795 08ROSSVL 69.0 250948 08WVMONI 69.0 1	LN	45	65.9	17.0	146.5	Violation caused by suspension	
2014SPCentoff	[REDACTED CONTINGENCY]	250847 08THRNTW 69.0 991964 THORNTWN 1.00 1	TR	69.9	84.1	47.2	120.4	Violation caused by suspension	

The Siemens PTI analysis indicates that these are existing problems in the base case with the Coleman and/or Century Aluminum Hawesville in normal operation. Because the overloads were pre-existing, Siemens PTI believes the branch loadings should not be included in the Y-2 or Y as a result of Coleman generator or Century load changes.

Siemens PTI agrees with the Voltage results presented in the Y-2 Table 1b. The voltage concerns with Coleman generation removed from service are limited to substations near the Coleman bus. These issues will be resolved with the installation of additional capacitor banks as shown in Table 2.



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**Attachment Y Study**  
**Coleman Units 1, 2 & 3: 443 MW Coal**  
**28 Month Suspension:**  
**September 1, 2013 – January 1, 2016**

# **ATTACHMENT Y STUDY REPORT**

August 29, 2013

**PUBLIC / REDACTED**

## **EXECUTIVE SUMMARY**

MISO received a completed Attachment Y Notification of Potential Generation Resource/SCU change of Status (Attachment Y Notice) from Big Rivers Electric Cooperation (BREC) dated May 24, 2013. The request was for suspension of units 1, 2 & 3 from September 1, 2013 to January 1, 2016.

After being reviewed for Transmission System reliability impacts as provided for under Section 38.2.7 of the MISO Open Access Transmission, Energy and Operating Reserve Markets Tariff (Tariff), MISO determined that potential reliability issues exist that would require the need for Coleman Units 1, 2 and 3 to enter into an System Support Resource (SSR) Agreement for the term of the suspension period.

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## I. INTRODUCTION

Big Rivers Electric Corporation submitted a completed Attachment Y Notification of Potential Generation Resource/SCU change of Status (Attachment Y Notice) dated May 24, 2013. The request was for suspension of units 1, 2 & 3 from September 1, 2013 to January 1, 2016.

After being reviewed for Transmission System reliability impacts as provided for under Section 38.2.7 of the MISO Open Access Transmission, Energy and Operating Reserve Markets Tariff (Tariff), MISO determined that potential reliability issues exist that would require the need for Coleman Units 1, 2 and 3 to enter into an System Support Resource (SSR) Agreement for the term of the suspension period.

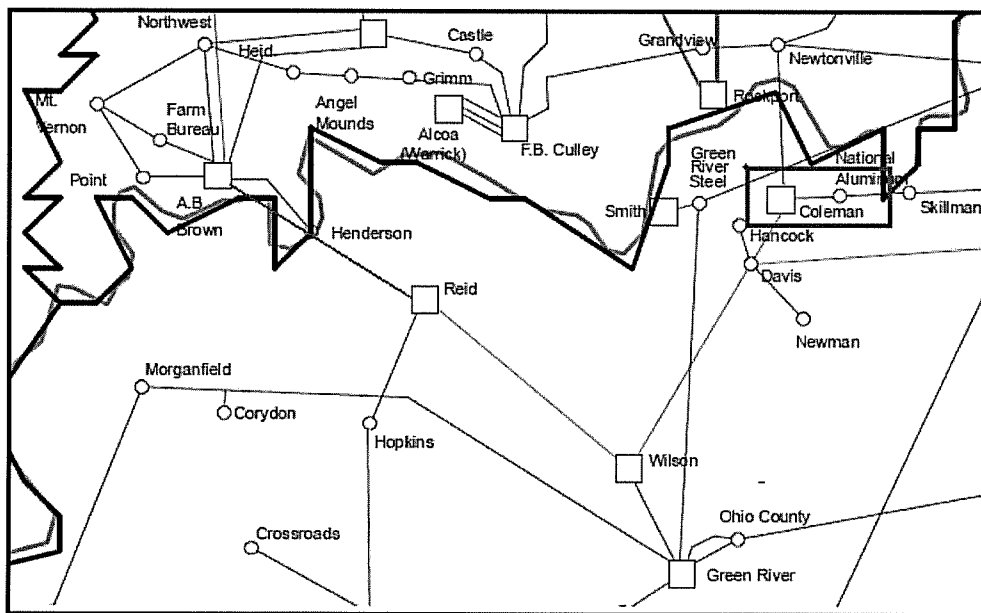


Figure 1: General Location of the Coleman Plant in Northern Kentucky

## II. STUDY OBJECTIVES

Under Section 38.2.7 of the MISO Tariff, SSR procedures maintain system reliability by providing a mechanism for MISO to enter into agreements with Market Participants (MP) that own or operate Generation Resources or Synchronous Condenser Units (SCUs) that have requested to either Retire or Suspend, but are required to maintain system reliability.

The principal objective of an Attachment Y study is to determine if the unit(s) for which a change in status is requested is necessary for system reliability based on the criteria set forth in the MISO Business Practices Manuals. The study work included monitoring and identifying the steady state branch/voltage violations on transmission facilities due to the unavailability of the

Generation Resource or SCU. The relevant MISO Transmission Owner and/or regional reliability criteria are used for monitoring such violations.

### III. MODELS AND ASSUMPTIONS

Corresponding to the anticipated suspension of the Coleman Units 1, 2, & 3 the following power system analysis source models were used for the study:

- 2014 Summer Peak
- 2014 Summer Peak with Stressed 2000MW MISO – TVA transfer
- 2017 Summer Peak
- 2017 Shoulder

The Attachment Y study models were created following the MISO Transmission Planning Business Practice Manual (BPM-020-r8) Section 6.2.2. This includes creating a set of models from each source model in which the units being studied are at full generation or taken out of service.

#### a. Model Assumptions

1. Load Sensitivity to Century Aluminium Plant (485 MW)

#### b. Transmission Projects

1. LGEE / KU Matanzas 161 kV Substation The new Matanzas 161 kV Substation has an anticipated in-service date of December 1, 2012. This new substation is included in the 2014 and 2017 models since the substation will be in-service during the time Coleman Generation is unavailable.

### c. Table of Models

n	Model	Coleman 1,2,3	Century Aluminum	Contingency Categories
1	2014SP	off	off	B, C1, C2, C5
2	2014SP	off	on	B, C1, C2, C5
3	2014SP	on	off	B, C1, C2, C5
4	2014SP	on	on	B, C1, C2, C5
5	2017SH	off	off	B, C1, C2, C3, C5
6	2017SH	off	on	B, C1, C2, C3, C5
7	2017SH	on	off	B, C1, C2, C3, C5
8	2017SH	on	on	B, C1, C2, C3, C5
9	2017SP	off	off	B, C1, C2, C5
10	2017SP	off	on	B, C1, C2, C5
11	2017SP	on	off	B, C1, C2, C5
12	2017SP	on	on	B, C1, C2, C5
13	2014SP Stressed	on	on	B, C1, C2, C5
14	2014SP Stressed	off	on at 338MW, with 200MVar cap bank at Coleman 161kV bus	B, C1, C2, C5

## IV. STUDY CRITERIA AND METHODOLOGY

Siemens PTI's Power System Simulator for Engineering (PSS/E) and Managing and Utilizing System Transmission (MUST) were used to perform AC contingency analysis.

Two phases of study have been studied. In phase 1, the system impact of Coleman generating units were evaluated by comparing the contingency analysis study result of the before Coleman suspension and after Coleman suspension case. The models were solved with automatic control of Load Tap Changers (LTCs), phase shifters, DC taps, switched shunts enabled (regulating), and area interchange disabled. The results are compared to determine if there were any criteria violations due to the change in the status for the unit(s).

Since reliability issues have been identified in Phase 1 study, and Coleman Units are identified as required SSR units, Phase 2 study was performed to evaluate the potential alternative to mitigate the reliability issue caused by suspension of the Coleman generating units. In this case, the potential reduction of Century load was evaluated.

### a. Applicable Transmission Planning Criteria

#### MISO Transmission Owners

AMIL Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for AMIL System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for AMIL System

AMIL Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, all substation voltages less than 95% or above 105%
- For Category B and C contingencies, all substation voltages less than 90% or above 110%

BREC Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for BREC System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for BREC System

BREC Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, all substation voltages less than 95% or above 105%
- For Category B and C contingencies, all substation voltages less than 92% or above 105%

DEI Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for DEI System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for BREC System

DEI Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 90% or above 105%

HE Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for HE System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for HE System

HE Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 90% or above 110%

SIGE Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for SIGE System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for SIGE System

SIGE Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 95% or above 105%



SIPC Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for SIGE System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for SIGE System

SIPC Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 91% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 91% or above 105%

### **Non-MISO Transmission Owners**

LGEE Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for LGEE System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for LGEE System

LGEE Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 90% or above 110%

TVA Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for TVA System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for TVA System

TVA Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 90% or above 110%

AECI Transmission Planning Criteria applied for the thermal analysis:

- For Category A contingencies, all thermal loadings exceeding 100% of the normal rating for AECI System
- For Category B and C contingencies, all thermal loadings exceeding 100% of the emergency rating for AECI System

AECI Transmission Planning Criteria applied for the voltage analysis:

- For Category A contingencies, >100 kV substation voltages less than 95% or above 105%
- For Category B and C contingencies, >100 kV substation voltages less than 90% or above 110%

Under category C contingencies, for the valid thermal and voltage violations as specified above, generation re-dispatch, system reconfiguration, and/or load shedding will be considered if applicable.

## b. MISO Transmission Planning BPM - SSR Criteria

As specified in MISO BPM-020-r7, the SSR criteria for determining if an identified facility is impacted by the generator's change of status will be:

- Under system intact and contingent events, branch thermal violations are only valid if the flow increase on the element in the "after" retirement scenario is equal to or greater than:
  - a) 5% of the "to-be-retired" unit(s) MW amount (i.e. 5% Power Transfer Distribution Factor (PTDF)) for a "base" violation compared with the "before" retirement scenario, or
  - b) 3% of the "to-be-retired" unit(s) amount (i.e. 3% Outage Transfer Distribution Factor (OTDF)) for a "contingency" violation compared with the "before" retirement scenario.
- Under system intact and contingent events, high and low voltage violations are only valid if the change in voltage is greater than 1% as compared to the "before" retirement voltage calculation.

## c. Contingencies

A subset of the MISO Transmission Expansion Plan (MTEP) contingencies in the central region was used for AC contingency analysis. Additional contingencies from TVA, LG&E, and AECI were included in this analysis to provide coverage for events on those adjacent transmission systems.

The following North American Electric Reliability Corporation (NERC) Categories of contingencies were evaluated:

1. Category A when the system is under normal conditions.
2. Category B contingencies resulting in the loss of a single element.
3. Category C contingencies resulting in the loss of two or more (multiple) elements.
4. Maintenance outage condition with forced outage during shoulder load conditions.

# V. STUDY RESULTS

## a. Phase 1 Study Results

### 1 Branch Results (Appendix A Table 1a)

Table 1a in Appendix A shows contingent conditions causing branch criteria violations without Coleman Units 1 & 2 & 3 and the improvements resulting from the operation of Coleman Units 1 & 2 & 3. Contingent events causing branch violations include NERC Categories B, C1, C2, and C3. While the study scenario with Century Aluminum off does indicate fewer constraints, there remain a few thermal loading issues resulting from Category C contingencies that exist on the MISO Transmission system even with the load removed.

### 2 Voltage Results (Appendix A Table 1b)

Significant voltage criteria violations associated with the suspension of Coleman Units 1, 2, & 3 and continued operation of Century Aluminum were identified when compared to the continued

availability of the units. Table 1 in Appendix A shows contingent conditions causing criteria violations without Coleman Units 1, 2, & 3 and the improvements resulting from the operation of Coleman Units 1, 2, & 3. Contingent events causing voltage criteria violations include NERC Categories B, C1, C2, and C3. The acceptable post-contingency voltage range is between 0.92 per unit to 1.05 per unit. Therefore, voltages less than 0.92 or greater than 1.05 per unit are a criteria violation. If Century Aluminum were to cease operations, with a load of 0 MVA, the voltage issues within the MISO would be eliminated.

## b. Phase 2 Study Results

### 1 FCITC Transfer Study

FCITC studies were performed to determine the maximum Century load without causing transmission system violation.

Three scenarios were studied to determine the maximum Century load

- 2014 summer peak
- 2017 summer shoulder
- 2014 summer peak with stressed 2000MW MISO-TVA transfer

The Stressed 2014 summer peak scenario was identified as the worst scenario. The maximum Century load was identified as 338MW under system intact and N-1 condition, 200MVar Capacitor Bank at Coleman 161kV bus is required to mitigate voltage violations. The most limiting element is Newtonville – Coleman 161 kV branch and the most critical contingency is the outage of [REDACTED] and [REDACTED].

The Prior-outage scenario was evaluated using the 2014 summer peak stressed case, the maximum Century Load was identified as 132MW under prior outage of [REDACTED] and two [REDACTED]. The most limiting element is Newtonville – Coleman 161 kV branch and the most critical contingency is BREC\_B5, which is outage of [REDACTED]. The results are available as Appendix B.

### 2 Voltage Stability Analysis (PV analysis) on C3 Contingency Event

The C3 contingency events were studied to determine the potential for voltage collapse, and the non-converged (blow up) event was selected for Voltage Stability (PV) analysis. The double outage of [REDACTED] and [REDACTED] was identified as a condition causing voltage collapse.

PV analysis was performed to identify the maximum Century load before the voltage collapse. Figure below shows the PV curve of the transfer from AMIL to Century load. The maximum Century load before voltage collapse was identified to be 230MW.

The study assumptions are summarized as follows,

- Study case: 2014 Summer Peak with 2000MW transfer from MISO to TVA
- C3 Contingency: [REDACTED] and [REDACTED]
- Capacitor Bank: 200Mvar Capbank at Coleman 161kV bus

- Transfer: AMIL to Century load

Figure 2 below shows the PV curve of power transfer from AMIL to Century load against bus voltage of Coleman 161kV bus, Skillman 161kV bus and Davis 161kV bus under the C3 Contingency of [REDACTED] and [REDACTED]. The maximum Century load before voltage collapse was identified to be 230MW.

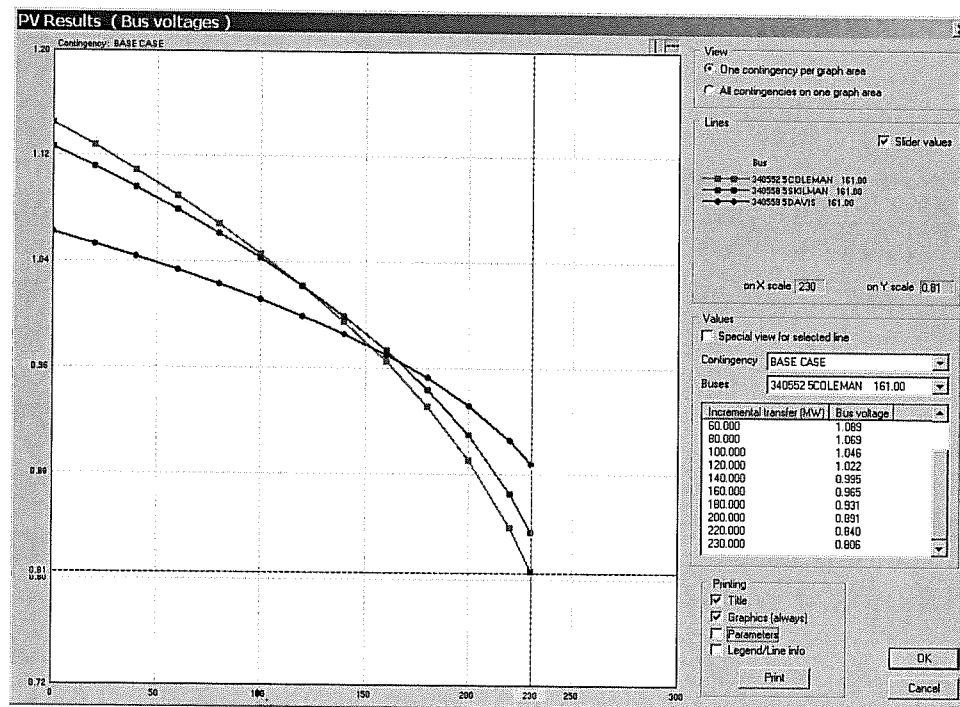


Figure 2: PV Curve on Dbl Contingency of [REDACTED]

## VI. CONCLUSION

The study results indicate that potential reliability issues exist which would require the need for Coleman Units 1, 2 and 3 to enter into an SSR Agreement until the units return from suspension, in accordance with Section 38.2.7 of the MISO Open Access Transmission, Energy & Operating Reserve Markets Tariff ("Tariff"). In addition to determining if reliability issues result from the suspension, further analysis was performed to identify the areas that are subject to allocation of the SSR costs. The areas identified for the cost allocation are Big Rivers Electric Corporation (BREC) and Southern Illinois Gas & Electric (SIGE).

The reduction of Century Load is identified as a potential alternative to avoid entering Coleman SSR agreement. The reductions are summarized as follows,

### *Century Load Maximum Loading Study Result*

- System intact condition
  - Maximum Century Loading: 338MW
  - Most limiting element/Critical contingency
    - Newtonville – Coleman 161/ [REDACTED]
- Prior outage condition
  - Maximum Century Loading: 132MW
  - Most limiting prior outage
    - [REDACTED]
  - Most limiting element/Critical contingency under prior outage
    - Newtonville – Coleman 161 / [REDACTED]
- Voltage Collapse
  - Maximum Century Loading: 230MW
  - Most limiting C3 Contingency
    - [REDACTED]

## VII. SSR AGREEMENT COST ALLOCATION

MISO utilizes a load shed methodology to determine the reliability benefits to each MISO Local Balancing Area (LBA) of operation, without the SSR unit(s). Although load shed is not permitted for NERC Category A or B events, this methodology determines the load shed amount needed to relieve all Category B reliability issues and the most severe Category C reliability issues identified, as a proxy for the reliability benefit of the SSR unit operation. The potential SSR Agreement LBA shares that were calculated for this Attachment Y-2 study are included below in Table 2.

**Table 2: SSR Agreement LBA Shares**

LBA	Load Shed (MW)	LBA Share
BREC	1504	99.5%
SIGE	7	.5%
Total	1511	100.00%

## VIII. ANALYSIS OF ALTERNATIVES

### c. New Generation or Generation Redispatch

No new dispatchable generation is currently planned for the impacted region. Existing generation is not available for sufficient redispatch to mitigate the overloads and voltage issues identified in the analysis.

#### d. System Reconfiguration and Operation Guidelines

Currently no operating procedures are available that would address specific contingency events to maintain transmission loading within limits. Local loads are in the immediate vicinity of the constraints with a direct impact on facilities and reconfiguration of the transmission is not effective.

#### e. Demand Response or Load Curtailment

In Phase 2 of the analysis, FCITC studies were performed to determine the maximum Century load without causing transmission system violation.

Three scenarios were studied to determine the maximum Century Load

- 2014 summer peak
- 2017 summer shoulder
- 2014 summer peak with stressed 2000MW MISO-TVA transfer

The stressed 2014 summer peak scenario was identified as the worst case scenario. The maximum Century load was identified as 338MW under system intact and N-1 condition with a 200MVar capacitor bank at the Coleman 161kV bus required to mitigate voltage violations. The prior-outage scenario of the [REDACTED] and [REDACTED] was evaluated using the 2014 summer peak stressed case and the maximum Century load was identified as 132MW with the most limiting element identified to be the Newtonville – Coleman 161 kV line for the loss of the [REDACTED].

Voltage Stability (PV) analysis was performed to identify the maximum Century load that could be supported before the voltage collapse condition, which was determined to be 230MW.

The assessment of the potential demand response alternatives indicates that the presence of a large industrial customer provides a possible option for mitigating the reliability issues observed in the study. The analysis shows that a reduction of load can be effectively implemented to avoid the need for the Coleman units to remain available as System Support Resources if the customer is able to commit to the restrictions and the conditions of operation.

#### f. Transmission Projects

Big Rivers Electric Corporation has not identified transmission upgrades that would be completed within the 28 month period of suspension. The loading is directly impacted by the local industrial load at the Century plant and mitigation by load curtailment is preferred during the suspension period.

## IX. SUMMARY OF POTENTIAL SOLUTION

The suspension period is planned for 28 months from September 1, 2013 until January 1, 2016. The short timeframe for the suspension foregoes any need for transmission upgrades since the issue may be adequately managed by customer equipment upgrades and curtailment of industrial load.

Curtailement of load via demand response is expected to adequately address the transmission system overloads. Century load would need to be reduced to mitigate potential constraints. The maximum Century loading is 338MW under system intact conditions, 132MW under prior outage of [REDACTED] due to thermal loading and 230MW under prior outage of [REDACTED] to avoid potential voltage collapse.

A special protection scheme on Newtonville to Coleman 161kV may provide automated post-contingent response to relieve the system constraints. While the Century plant may operate at 480MW under system intact conditions, curtailment of Century load to 230MW following the outage of either [REDACTED] or [REDACTED] would be needed to avoid potential voltage collapse. Century Load will be reduced to 132MW at the outage of [REDACTED] and [REDACTED]. Additional SPS installations may also be required on other lines with different operating parameters.

MISO has been working with Century and Big Rivers Electric Corporation to develop the load curtailment plan, and efforts continue in developing necessary operating guides and protection schemes as well as the agreement terms for implementation of the demand response option. However, the necessary arrangements will not be completed by the suspension date and the Coleman Units 1, 2 & 3 will initially be required as System Support Resources.

## **X. APPENDICES**

### **Appendix A: Steady-State AC Contingency Results**

Table 1a: Branch Results

Table 1b: Voltage Results

### **Appendix B: FCITC Study Results**

Table 2a: 2014SP FCITC

Table 2b: 2017SH FCITC

Table 2c: 2014SP Stressed FCITC

Table 2d: 2014SP Stressed FCITC under Double Outage Condition

Table 2e: PSS/e verification on 2014SP Stressed Scenario

**Appendix A**

**Steady-State AC Contingency Analysis Results**





Table 1a: Branch Results

MISO Coleman Units 1, 2, & 3 Attachment Y-2 Study - Compare Branch Results  
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Model	Contingency Description	Limiting Element		Coleman 1, 2, & 3 OFF				Coleman 1, 2, & 3 ON				MISO Impact		MISO Comments	
		From Bus	To Bus	Count	Base Flow	Loading %	Cont. MVA	Base Flow	Loading %	Cont. MVA	Worst M/W	POTDF (P-5%)			
2017SP	(REDACTED)	LN	LN	35	35.8	24.9	102.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	(REDACTED)	LN	LN	58.4	62.7	61.4	107.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	(REDACTED)	LN	LN	25	28.2	27.2	112.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	(REDACTED)	LN	LN	25	28.2	27.2	112.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	(REDACTED)	LN	LN	58.4	62.2	61.2	106.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	(REDACTED)	LN	LN	58.4	60.0	61.2	102.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	202	232.6	38.0	115.2	219.4	35.0	108.6	13.4	3.0246307	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	382	389.9	94.9	101.8	371.0	95.6	97.1	17.9	4.0485321	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	382	389.3	94.9	101.7	370.5	95.6	97.0	17.8	4.0186597	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	335	434.2	133.5	129.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	335	434.4	133.6	129.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	35	37.1	24.6	106.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	28	29.0	11.0	103.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	28	28.4	19.7	105.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	58.4	61.6	62.7	105.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	245	251.4	181.2	102.6	236.0	172.3	95.3	15.4	3.475298	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	223	238.1	93.0	106.8	214.2	56.1	96.1	23.9	5.3590338	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	223	238.2	92.6	126.1	250.2	79.5	112.2	31.0	6.937427	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	58.4	61.7	62.7	105.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	58.4	61.7	62.7	105.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	245	249.9	181.2	101.6	233.5	172.3	95.3	15.4	3.475298	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	223	232.5	63.0	104.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	58.4	60.6	61.6	103.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation made worse by suspension
2017SH	(REDACTED)	LN	LN	956	1177.0	693.4	123.1	1161.5	692.2	121.5	15.5	3.4988713	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	448	465.3	250.7	103.9	451.7	249.1	100.8	13.6	3.0659974	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	263	293.2	60.8	111.5	279.5	60.2	106.3	13.7	3.0225508	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	263	293.5	60.8	111.6	279.7	60.2	106.4	13.8	3.1151242	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	202	236.0	39.5	116.9	220.2	35.8	109.0	15.8	3.565914	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	202	266.3	73.5	131.8	251.0	70.2	124.2	15.3	3.4537246	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	264	266.4	44.5	100.9	251.3	44.8	95.2	15.1	3.4085779	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	382	390.9	95.5	102.3	370.2	96.0	96.9	20.7	4.6726652	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	264	266.3	44.5	100.9	251.2	44.8	95.1	15.1	3.4085779	Violation caused by suspension		
2017SH	(REDACTED)	TR	TR	382	390.4	95.5	102.2	369.6	96.0	96.8	20.8	4.6522956	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	956	1054.9	693.4	110.3	1039.9	692.2	108.8	15.0	3.3860045	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	224	232.8	25.8	144.5	295.9	22.6	132.1	27.9	3.1827769	Violation made worse by suspension		
2017SH	(REDACTED)	TR	TR	112	126.0	92.7	112.5	111.6	92.8	99.7	14.4	6.2079684	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	64	67.8	32.1	106.0	#N/A	#N/A	#N/A	#N/A	3.2505843	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	70	71.5	35.8	102.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	472.1	492.1	319.4	104.2	478.7	314.4	101.4	13.4	3.0248307	Violation caused by suspension		
2017SH	(REDACTED)	LN	LN	58.4	61.6	62.7	105.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation made worse by suspension
2017SH	(REDACTED)	LN	LN	223	234.2	59.3	100.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	223	261.8	83.9	117.4	230.1	70.6	103.2	31.7	7.1557582	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	58.4	63.9	62.7	109.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	58.4	61.7	62.7	105.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SH	(REDACTED)	LN	LN	223	255.3	83.9	114.5	223.6	70.6	100.3	31.7	7.1557582	Violation made worse by suspension		
2017SH	(REDACTED)	LN	LN	58.4	61.7	62.7	105.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension

Table 1b. Voltage Results

MISO Coleman Units 1, 2, & 3 Attachment Y-2 Study - Compare Voltage Results  
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Model	Contingency Description	Limiting Element						Coleman 1, 2, & 3 OFF						Coleman 1, 2, & 3 ON						Unit Impact Vol/Von (P-01)	MISO Comments
		Bus #	Bus Name	KV	Area	Zone	Low Limit	Upp Limit	Cont Volt	Base Volt	Vol	Cont Volt	Base Volt	Vol	Cont Volt	Base Volt	Vol	Cont Volt	Base Volt		
2014SP	[REDACTED]	161	207	207	1.1	0.9	1.1	0.8516	0.9693	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248887	07NWTNVL	161	207	207	1.1	0.9	1.1	0.873	0.9793	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340552	SCOLEMAN	161	314	1314	0.92	1.05	0.8125	0.9607	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340557	SHANCO	161	314	1314	0.92	1.05	0.8214	0.9669	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340558	SSKILMAN	161	314	1314	0.92	1.05	0.8487	0.9798	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9081	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340564	SNATAL	161	314	1314	0.92	1.05	0.8235	0.97	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8958	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340621	SCOLEEHV	161	314	1314	0.92	1.05	0.8171	0.9676	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248435	07NWTNVL	161	207	207	0.9	1.1	0.8516	0.9693	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340552	SCOLEMAN	161	314	1314	0.92	1.05	0.8125	0.9607	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248887	07NWTNVL	161	207	207	0.9	1.1	0.873	0.9793	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340557	SHANCO	161	314	1314	0.92	1.05	0.8214	0.9669	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340558	SSKILMAN	161	314	1314	0.92	1.05	0.8487	0.9798	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9081	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340563	7COLEMAN	345	314	1314	0.92	1.05	0.8171	0.9928	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340564	SNATAL	161	314	1314	0.92	1.05	0.8235	0.97	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8958	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340621	SCOLEEHV	161	314	1314	0.92	1.05	0.8171	0.9676	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248435	07NWTNVL	161	207	207	0.9	1.1	0.8516	0.9693	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248887	07NWTNVL	161	207	207	0.9	1.1	0.873	0.9793	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340552	SCOLEMAN	161	314	1314	0.92	1.05	0.8125	0.9607	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340557	SHANCO	161	314	1314	0.92	1.05	0.8214	0.9669	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340558	SSKILMAN	161	314	1314	0.92	1.05	0.8487	0.9798	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9081	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340563	7COLEMAN	345	314	1314	0.92	1.05	0.8171	0.9928	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340564	SNATAL	161	314	1314	0.92	1.05	0.8235	0.97	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8958	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340621	SCOLEEHV	161	314	1314	0.92	1.05	0.8171	0.9676	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9029	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8905	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9028	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8905	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340559	SDAVIS	161	314	1314	0.92	1.05	0.9028	0.9855	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340565	NEWMAN	161	314	1314	0.92	1.05	0.8905	0.9743	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248431	07BRISTW	161	207	207	0.9	1.1	0.846	1.0033	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248435	07NWTNVL	161	207	207	0.9	1.1	0.7325	0.9693	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248865	07TRY161	161	207	207	0.9	1.1	0.7926	0.9907	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248887	07NWTNVL	161	207	207	0.9	1.1	0.7605	0.9793	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340552	SCOLEMAN	161	314	1314	0.92	1.05	0.6378	0.9607	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248435	07NWTNVL	161	207	207	0.9	1.1	0.8516	0.9693	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	248887	07NWTNVL	161	207	207	0.9	1.1	0.873	0.9793	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340552	SCOLEMAN	161	314	1314	0.92	1.05	0.8125	0.9607	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340557	SHANCO	161	314	1314	0.92	1.05	0.8214	0.9669	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	
2014SP	[REDACTED]	340558	SSKILMAN	161	314	1314	0.92	1.05	0.8487	0.9798	L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension	

Table 1b: Voltage Results

MISO Coleman Units 1, 2, & 3 Attachment Y-2 Study - Compare Voltage Results  
 CONFIDENTIAL / CEIL - DO NOT RELEASE

Model	Contingency Description	Limiting Element				Coleman 1, 2, & 3 OFF				Coleman 1, 2, & 3 ON				Unit Impact Vgt/Von >0.01	MISO Comments	
		Bus #	Bus Name	KV	Area	Zone	Low Limit	High Limit	Cont Volt	Base Volt	Viol	Cont Volt	Base Volt			Viol
2014SP	[REDACTED]	161	340559.5DAVIS	161	314	314	0.92	1.05	0.9091	0.9855	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340564.5NATAL	161	314	314	0.92	1.05	0.8236	0.971	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340565.5NEWMAN	161	314	314	0.92	1.05	0.8959	0.9743	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340621.5COLEEVH	161	314	314	0.92	1.05	0.8172	0.9676	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340566.5MEADE	161	314	314	0.92	1.05	0.8775	0.9851	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340616.5N.HARD	161	314	314	0.92	1.05	0.8616	0.9957	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340566.5MEADE	161	314	314	0.92	1.05	0.8775	0.9851	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340616.5N.HARD	161	314	314	0.92	1.05	0.8616	0.9957	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340559.5DAVIS	161	314	314	0.92	1.05	0.9031	0.9855	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340565.5NEWMAN	161	314	314	0.92	1.05	0.8907	0.9743	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	248435.07NWTVL1	161	207	1207	0.9	1.1	0.8516	0.9683	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	248887.07NWTNVL	161	207	1207	0.9	1.1	0.873	0.9793	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340552.5COLEMAN	161	314	314	0.92	1.05	0.8125	0.9607	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340557.5HANCO	161	314	314	0.92	1.05	0.8214	0.9669	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340558.5SKILMAN	161	314	314	0.92	1.05	0.8487	0.9798	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340559.5DAVIS	161	314	314	0.92	1.05	0.9081	0.9855	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	345	340563.7COLEMAN	161	314	314	0.92	1.05	0.8171	0.9928	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340564.5NATAL	161	314	314	0.92	1.05	0.8235	0.971	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340565.5NEWMAN	161	314	314	0.92	1.05	0.8958	0.9743	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	340621.5COLEEVH	161	314	314	0.92	1.05	0.8171	0.9676	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	324139.5DORCHST	161	363	379	0.9	1.1	0.8832	1.0034	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	324149.5MRODEN	161	363	379	0.9	1.1	0.8724	1.0025	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2014SP	[REDACTED]	161	324157.5POCK N	161	363	379	0.9	1.1	0.8677	1.0048	L	1.1048	1.0053	H	-0.232	Violation caused by suspension
2014SP	[REDACTED]	161	324158.5POCKET	161	363	379	0.9	1.1	0.8677	1.0048	L	1.111	1.0052	H	-0.243	Violation caused by suspension
2014SP	[REDACTED]	138	324310.4SPENC	161	363	380	0.9	1.1	0.8823	0.9699	L	0.8718	0.9699	L	0.011	Pre-existing
2017SP	[REDACTED]	161	248435.07NWTVL1	161	207	1207	0.9	1.1	0.8482	0.9696	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248887.07NWTNVL	161	207	1207	0.9	1.1	0.8697	0.979	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552.5COLEMAN	161	314	314	0.92	1.05	0.8085	0.9602	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340557.5HANCO	161	314	314	0.92	1.05	0.8173	0.9662	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340558.5SKILMAN	161	314	314	0.92	1.05	0.8454	0.9791	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559.5DAVIS	161	314	314	0.92	1.05	0.9049	0.984	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340564.5NATAL	161	314	314	0.92	1.05	0.8197	0.9694	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565.5NEWMAN	161	314	314	0.92	1.05	0.8928	0.973	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340621.5COLEEVH	161	314	314	0.92	1.05	0.8132	0.967	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248435.07NWTVL1	161	207	1207	0.9	1.1	0.8482	0.9696	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248887.07NWTNVL	161	207	1207	0.9	1.1	0.8697	0.979	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552.5COLEMAN	161	314	314	0.92	1.05	0.8085	0.9602	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340557.5HANCO	161	314	314	0.92	1.05	0.8173	0.967	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340558.5SKILMAN	161	314	314	0.92	1.05	0.8454	0.9791	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559.5DAVIS	161	314	314	0.92	1.05	0.9049	0.984	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	345	340563.7COLEMAN	161	314	314	0.92	1.05	0.8132	0.9921	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340564.5NATAL	161	314	314	0.92	1.05	0.8197	0.9694	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565.5NEWMAN	161	314	314	0.92	1.05	0.8928	0.973	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340621.5COLEEVH	161	314	314	0.92	1.05	0.8132	0.967	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248435.07NWTVL1	161	207	1207	0.9	1.1	0.8482	0.9696	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	138	253581.10NTVL13	161	210	1210	0.95	1.05	0.8354	0.9903	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552.5COLEMAN	161	314	314	0.92	1.05	0.8085	0.9602	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340557.5HANCO	161	314	314	0.92	1.05	0.8173	0.9662	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340558.5SKILMAN	161	314	314	0.92	1.05	0.8454	0.9791	L	#N/A	#N/A	#N/A	#N/A	Violation caused by suspension



Table 1b: Voltage Results

MISO Coleman Units 1, 2, & 3 Attachment Y-2 Study - Compare Voltage Results  
 CONFIDENTIAL / CEII - DO NOT RELEASE

Model	Contingency Description	Limiting Element						Coleman 1, 2, & 3 OFF						Coleman 1, 2, & 3 ON			Unit Impact VGR Von >0.01	MISO Comments
		Bus #	Bus Name	KV	Area	Zone	Low Limit	Upp Limit	Cont Volt	Base Volt	Viol	Cont Volt	Base Volt	Viol	Cont Volt	Base Volt		
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.9049	0.984	L	0.9049	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	345	340563 7COLEMAN	1314	314	1314	0.92	1.05	0.8132	0.9921	L	0.8132	0.9921	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340564 5NATAL	1314	314	1314	0.92	1.05	0.8197	0.9694	L	0.8197	0.9694	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.8928	0.973	L	0.8928	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340521 5COLEEVH	1314	314	1314	0.92	1.05	0.8132	0.967	L	0.8132	0.967	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8924	0.984	L	0.8924	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.88	0.973	L	0.88	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8923	0.984	L	0.8923	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.9349	0.9697	L	0.9349	0.9697	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	253580 10NTVL16	1210	210	1210	0.95	1.05	0.8923	0.984	L	0.8923	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8923	0.984	L	0.8923	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.88	0.973	L	0.88	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8923	0.984	L	0.8923	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.88	0.973	L	0.88	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8923	0.984	L	0.8923	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.88	0.973	L	0.88	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248431 07BRISTW	207	207	1207	0.9	1.1	0.8436	1.0012	L	0.8436	1.0012	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248435 07NWTVL1	207	207	1207	0.9	1.1	0.7285	0.8696	L	0.7285	0.8696	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248865 07TRY161	207	207	1207	0.9	1.1	0.7568	0.979	L	0.7568	0.979	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552 5COLEMAN	1314	314	1314	0.92	1.05	0.8327	0.9602	L	0.8327	0.9602	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248435 07NWTVL1	207	207	1207	0.9	1.1	0.8462	0.9696	L	0.8462	0.9696	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248887 07NWTNVL	207	207	1207	0.9	1.1	0.8697	0.979	L	0.8697	0.979	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552 5COLEMAN	1314	314	1314	0.92	1.05	0.8085	0.9602	L	0.8085	0.9602	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340557 5HANC0	1314	314	1314	0.92	1.05	0.8174	0.9662	L	0.8174	0.9662	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340558 5SKILMAN	1314	314	1314	0.92	1.05	0.8455	0.9791	L	0.8455	0.9791	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.9049	0.984	L	0.9049	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340564 5NATAL	1314	314	1314	0.92	1.05	0.8198	0.9694	L	0.8198	0.9694	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.8928	0.973	L	0.8928	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340621 5COLEEVH	1314	314	1314	0.92	1.05	0.8132	0.967	L	0.8132	0.967	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340566 5MEAD0	1314	314	1314	0.92	1.05	0.8653	0.9846	L	0.8653	0.9846	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340616 5NHARD	1210	210	1210	0.95	1.05	0.8484	0.9956	L	0.8484	0.9956	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	253580 10NTVL16	1210	210	1210	0.95	1.05	0.9367	0.9697	L	0.9367	0.9697	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	253580 10NTVL16	1210	210	1210	0.95	1.05	0.9367	0.9697	L	0.9367	0.9697	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340566 5MEAD0	1314	314	1314	0.92	1.05	0.8654	0.9846	L	0.8654	0.9846	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340616 5NHARD	1210	210	1210	0.92	1.05	0.8484	0.9956	L	0.8484	0.9956	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.8952	0.984	L	0.8952	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.8829	0.973	L	0.8829	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248435 07NWTVL1	207	207	1207	0.9	1.1	0.8482	0.9696	L	0.8482	0.9696	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	248887 07NWTNVL	207	207	1207	0.9	1.1	0.8697	0.979	L	0.8697	0.979	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340552 5COLEMAN	1314	314	1314	0.92	1.05	0.8085	0.9602	L	0.8085	0.9602	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340557 5HANC0	1314	314	1314	0.92	1.05	0.8173	0.9662	L	0.8173	0.9662	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340558 5SKILMAN	1314	314	1314	0.92	1.05	0.8454	0.9791	L	0.8454	0.9791	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340559 5DAVIS	1314	314	1314	0.92	1.05	0.9049	0.984	L	0.9049	0.984	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	345	340563 7COLEMAN	1314	314	1314	0.92	1.05	0.8132	0.9921	L	0.8132	0.9921	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340564 5NATAL	1314	314	1314	0.92	1.05	0.8197	0.9694	L	0.8197	0.9694	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340565 5NEWMAN	1314	314	1314	0.92	1.05	0.8928	0.973	L	0.8928	0.973	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	340621 5COLEEVH	1314	314	1314	0.92	1.05	0.8132	0.967	L	0.8132	0.967	L	#N/A	#N/A	#N/A	Violation caused by suspension
2017SP	[REDACTED]	161	360430 5SHARRIMAN TN	347	347	1388	0.9	1.1	0.7649	1.0426	L	0.7622	1.0427	L	#N/A	#N/A	#N/A	Violation caused by suspension

Table 1b: Voltage Results

MISO Coleman Units 1, 2, & 3 Attachment Y-2 Study - Compare Voltage Results  
 CONFIDENTIAL / CEIL - DO NOT RELEASE

Model	Contingency Description	Limiting Element						Coleman 1, 2, & 3 OFF				Coleman 1, 2, & 3 ON				Unit Impact (Voff/Von >0.01)
		Bus #	Bus Name	KV	Area	Zone	Low Limit	Upp Limit	Cont Volt	Base Volt	Viol	Cont Volt	Base Volt	Viol	MISO Comments	
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7641	1.0477	L	0.7815	1.0477	L	-0.017	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7638	1.0474	L	0.7812	1.0474	L	-0.017	Pre-existing
2017SP	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.6888	1.0426	L	0.7309	1.0427	L	-0.042	Pre-existing
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.6889	1.0477	L	0.7311	1.0477	L	-0.042	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.6885	1.0474	L	0.7307	1.0474	L	-0.042	Pre-existing
2017SP	[REDACTED]	361383	5W OAK RIDGT	161	347	1368	0.9	1.1	0.689	1.0479	L	0.7312	1.0479	L	-0.042	Pre-existing
2017SP	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.6979	1.0426	L	0.7309	1.0427	L	-0.033	Pre-existing
2017SP	[REDACTED]	360892	5ROANE BH2	161	347	1368	0.9	1.1	0.6981	1.0479	L	0.7312	1.0479	L	-0.033	Pre-existing
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.6981	1.0477	L	0.7311	1.0477	L	-0.033	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.6976	1.0474	L	0.7307	1.0474	L	-0.033	Pre-existing
2017SP	[REDACTED]	361383	5W OAK RIDGT	161	347	1368	0.9	1.1	0.6981	1.0479	L	0.7312	1.0479	L	-0.033	Pre-existing
2017SP	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.7308	1.0426	L	0.6782	1.0426	L	0.053	Pre-existing
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.731	1.0477	L	0.6784	1.0477	L	0.053	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7306	1.0474	L	0.6779	1.0474	L	0.053	Pre-existing
2017SP	[REDACTED]	361383	5W OAK RIDGT	161	347	1368	0.9	1.1	0.731	1.0479	L	0.6784	1.0479	L	0.053	Pre-existing
2017SP	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.7556	1.0426	L	0.7821	1.0426	L	-0.027	Pre-existing
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7548	1.0477	L	0.7814	1.0477	L	-0.027	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7544	1.0474	L	0.781	1.0474	L	-0.027	Pre-existing
2017SP	[REDACTED]	361383	5W OAK RIDGT	161	347	1368	0.9	1.1	0.7308	1.0426	L	0.6782	1.0426	L	0.053	Pre-existing
2017SP	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.731	1.0479	L	0.6784	1.0479	L	0.053	Pre-existing
2017SP	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7306	1.0474	L	0.6779	1.0474	L	0.053	Pre-existing
2017SP	[REDACTED]	361383	5W OAK RIDGT	161	347	1368	0.9	1.1	0.731	1.0479	L	0.6784	1.0479	L	0.053	Pre-existing
2017SP	[REDACTED]	360430	5HARRIMAN TN	161	347	1367	0.9	1.1	0.5784	1.0104	L	0.5537	1.0104	L	0.025	Pre-existing
2017SH	[REDACTED]	340566	5MEADE	161	314	1314	0.92	1.05	0.9011	0.9887	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340616	5N HARO	161	314	1314	0.92	1.05	0.8888	0.988	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	248435	07NWTVL1	161	207	1207	0.9	1.1	0.8438	0.9768	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	248865	07TRY161	161	207	1207	0.9	1.1	0.8832	0.9921	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	248887	07NWTNL	161	207	1207	0.9	1.1	0.8622	0.9831	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340552	5COLEMAN	161	314	1314	0.92	1.05	0.8082	0.9699	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340558	5SHANCO	161	314	1314	0.92	1.05	0.8109	0.9696	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340558	5SKILMAN	161	314	1314	0.92	1.05	0.8386	0.9824	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340559	5DAVIS	161	314	1314	0.92	1.05	0.8082	0.9831	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340563	7COLEMAN	345	314	1314	0.92	1.05	0.8082	0.9831	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340564	5NATAL	161	314	1314	0.92	1.05	0.8128	0.9724	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	340565	5NEWMAN	161	314	1314	0.92	1.05	0.8933	0.9798	L	#N/A	#N/A	#N/A	Violation caused by suspension	
2017SH	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.757	1.0422	L	0.7804	1.0424	L	-0.023	Pre-existing
2017SH	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7562	1.0473	L	0.7797	1.0474	L	-0.024	Pre-existing
2017SH	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7558	1.047	L	0.7793	1.0472	L	-0.024	Pre-existing
2017SH	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.757	1.0422	L	0.7803	1.0424	L	-0.023	Pre-existing
2017SH	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7562	1.0473	L	0.7796	1.0474	L	-0.023	Pre-existing
2017SH	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7558	1.047	L	0.7793	1.0472	L	-0.024	Pre-existing
2017SH	[REDACTED]	324310	4SPENC	138	363	380	0.9	1.1	0.8782	0.9882	L	0.8646	0.9882	L	0.014	Pre-existing
2017SH	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.757	1.0422	L	0.7803	1.0423	L	-0.023	Pre-existing
2017SH	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7562	1.0473	L	0.7796	1.0474	L	-0.023	Pre-existing
2017SH	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7558	1.047	L	0.7793	1.0471	L	-0.024	Pre-existing
2017SH	[REDACTED]	360033	3RUIJON MS	500	347	1368	0.9	1.1	0.8606	1.0475	L	0.8793	1.0476	L	-0.019	Pre-existing
2017SH	[REDACTED]	360430	5HARRIMAN TN	161	347	1368	0.9	1.1	0.757	1.0422	L	0.7803	1.0423	L	-0.023	Pre-existing
2017SH	[REDACTED]	361099	5BLAIR RD TP	161	347	1368	0.9	1.1	0.7562	1.0473	L	0.7796	1.0474	L	-0.023	Pre-existing
2017SH	[REDACTED]	361146	5BLAIR RD TN	161	347	1368	0.9	1.1	0.7558	1.047	L	0.7793	1.0471	L	-0.024	Pre-existing

# **Appendix B**

## **FCITC Study Results**





Table 2c: 2014SP Stressed FCITC (Century Load is modeled as 10MW as initial value)

From	To	Transf. z Level	AC FCITC	DC FCITC	Delta FCITC	Limiting Constraint	Contingency	Non	Preshift	PostShift	Making AC TDF	DC TDF	LODF	PTDF
AMTL	LD CENTURY	1000.0	307.5	348.7	-41.2	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	1167	123.2	334.6	335.0	0.66752	0.66547	0.36848
							(REDACTED)							
							(REDACTED)							
							(REDACTED)							
			307.5	348.7	-41.2	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	2607	123.2	334.6	335.0	0.66752	0.66547	0.36848
							(REDACTED)							
							(REDACTED)							
			307.5	348.7	-41.2	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	1168	123.2	334.6	335.0	0.66752	0.66547	0.36848
							(REDACTED)							
							(REDACTED)							
			542.7	630.3	-87.6	LD:340552 SCOLEPMAN 161 340621 SCOLEERV 161 2	(REDACTED)	2423	49.9	334.6	335.0	0.52468	-0.52289	-0.33021
							(REDACTED)							
							(REDACTED)							
			541.7	630.6	-88.9	LD:340552 SCOLEPMAN 161 340621 SCOLEERV 161 2	(REDACTED)	1193	49.4	334.1	335.0	0.52558	-0.52289	-0.33021
							(REDACTED)							

Table 2d: 2014SP Stressed FCITC under Double Outage Condition(Century Load is modeled as 10MW as initial value)

From	To	Transf. z Level	AC FCITC	DC FCITC	Delta FCITC	Limiting Constraint	Contingency	Non	Preshift	PostShift	Making AC TDF	DC TDF	LODF	PTDF
AMTL	LD CENTURY	1000.0	122.2	121.2	0.9	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	209	252.5	334.9	335.0	0.67494	0.62009	0.36849
							(REDACTED)							
							(REDACTED)							
			183.2	172.1	11.1	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	533	263.6	335.0	335.0	0.38952	0.45046	0.36849
							(REDACTED)							
							(REDACTED)							
			197.1	187.3	9.9	LD:248435 07NMTV01 161 340552 SCOLEPMAN 161 1	(REDACTED)	161	255.0	335.0	335.0	0.40555	0.46281	0.36849
							(REDACTED)							
			177.7	202.0	-24.3	LD:340551 SREID 161 340559 SDAVIS 161 1	(REDACTED)	4	232.9	335.3	335.0	0.57636	0.58700	0.30449
							(REDACTED)							
							(REDACTED)							
		NetCom	277.2		-277.2	LD:340557 SHANCO 161 340559 SDAVIS 161 1	(REDACTED)	4	*****	*****	*****	*****	-0.58200	-0.10449
							(REDACTED)							

Table 2e: P55/e Verification on 2014SP Stressed Case on the outage of BERC\_B3

	Contingency Event (MW)	P	Q	R	S	T	V p.u.	V kV	I- rating	Current Loading	
Coleman	318	306.9	105.5	324.5771	1147.097196			1.019	164.059	1201.354	95.07%
Newtonsville	318	310.1	87.5	322.2084	1147.909792			1.011	162.771	1201.354	95.14%
Coleman	338	319.3	96	333.4194	1181.507757			1.012	163.932	1201.354	98.35%
Newtonsville	338	322.8	76.7	331.7872	1182.736096			1.008	161.966	1201.354	98.45%
Coleman	348	325.5	91.3	338.0621	1201.571295			1.009	162.449	1201.354	100.01%
Newtonsville	348	329.1	71.2	336.7139	1202.689634			1.004	161.644	1201.354	100.11%

(REDACTED)  
 (REDACTED)  
 (REDACTED)  
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**ATTACHMENT Y-1 Standard Form System Support Resource (SSR) Agreement Version:**

**4.0.0 Effective: 6/1/2013**

**ATTACHMENT Y-1**

**Standard Form System Support Resource (“SSR”) Agreement**

**Between**

**(Participant)**

**Big Rivers Electric Corporation**

**and**

**Midcontinent Independent System Operator, Inc.**

This SSR Agreement (“Agreement”), effective as of the 1<sup>st</sup> of \_\_\_\_\_, September, 2013 (“Effective Date”), is entered into by and between ~~insert Participant’s name~~, Big Rivers Electric Corporation, a ~~insert business entity type~~ generation and state transmission cooperative located in the Commonwealth of Kentucky (“Participant”) and Midcontinent Independent System Operator, Inc. (“MISO,” collectively with Participant, the “Parties”).

Recitals

WHEREAS:

- A. Participant owns or operates ~~a one or more Electric Generation Resource~~ Resources or a Synchronous Condenser Unit (“SCU”) as defined in the MISO Tariff, and MISO requires Participant to supply service in the MISO Transmission Provider region (“MISO Region”) in order to maintain the reliability of the Transmission System;
- B. MISO is the Regional Transmission Organization (“RTO”) for the MISO Region; and
- C. The Parties enter into this Agreement in order to establish the terms and conditions by which MISO and Participant will discharge their respective duties and responsibilities

under the MISO Tariff.

Agreements

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, MISO and Participant (the "Parties") hereby agree as follows:

Section 1. Unit-Specific Terms.

A. Start Date: \_\_\_\_\_, 20\_\_\_\_, September 1, 2013.

B. Start Time: \_\_\_\_\_ 000 Hrs. \_\_\_\_\_

C. Unit: \_\_\_\_\_.

C. Unit: Coleman Generating Station Units 1-3 ("Unit 1," "Unit 2," and "Unit 3");

provided, however, that "Unit" or "Units" shall not include any Unit with respect to which this Agreement is terminated pursuant to the terms hereof.

The ~~unit~~units described above may also be referred to as the "Designated ~~Unit~~Units" or "UnitUnits" or "SSR ~~Unit~~Units" (or in the singular in reference to an individual unit) in this Agreement.

D. Description of Unit [*including location, number of generators, etc.*]:

\_\_\_\_\_

\_\_\_\_\_, Units: Coleman Generating Station Units

1-3, located in Hawesville, Kentucky, as may be described in more detail on Exhibit 1

attached hereto. ~~If Unit is a combined cycle Generation Resource, indicate the Unit's~~

~~operational capability consistent with the requirements of the MISO Tariff.~~

E. Name Plate Information [*Fill out for applicable type of unit checked in Subsection 1.B above*]

SSR Unit

(a) SSR Capacity in MW: 443 MW (150 for Unit 1; 138 for Unit 2; 155 for Unit 3)

(b) Power Factor Lagging

(i) 0.85 (Unit 1 & Unit 2); 0.90 (Unit 3) P.F. (at Generator Main Leads)

(ii) N/A P.F. (at high side of Main Power Transformer)

(c) Power Factor Leading

(i) 0.85 (Unit 1 & Unit 2); 0.90 (Unit 3) P.F. (at Generator Main Leads)

(ii) N/A P.F. (at high side of Main Power Transformer)

F. Delivery Point: \_\_\_\_\_ Points: BREC.COLE1; BREC.COLE2; BREC.COLE3

G. Revenue Meter Location (Use Resource IDs): \_\_\_\_\_ N/A

H. Operational and Environmental Limitations (check and describe all that apply):

SSR Unit:

(a) Operational

Maximum annual hours of operation: \_\_\_\_\_

Maximum annual MWh: \_\_\_\_\_

Maximum annual starts: \_\_\_\_\_

Other: \_\_\_\_\_  Other:

Maximum of one (1) start per week, per unit

(b) Environmental

Maximum annual NO<sub>x</sub> emissions: \_\_\_\_\_

Maximum annual SO<sub>2</sub> emissions: \_\_\_\_\_ 5.2

lbs/MMBTU daily average for \_\_\_\_\_ each unit (Unit 1, Unit 2, and Unit 3)

Other: \_\_\_\_\_

Other: Particulate limit of 0.27 lbs/MMBTU (3 hr. avg.) for each unit (Unit 1, Unit 2, and Unit 3); Trigger opacity limits of 72% (duct), 23.6% (bypass) for Unit 1; 62% (duct), 19.8% (bypass) for Unit 2; and 67% (duct), 22.0% (bypass) for Unit 3

Section 2. Definitions.

- A. Unless herein defined, all definitions and acronyms found in the MISO Tariff shall be incorporated by reference into this Agreement.
- B. "MISO Tariff" shall mean the document adopted by MISO, including any attachments or exhibits referenced in that document, as amended from time to time, that contains the scheduling, operating, planning, reliability, and settlement (including customer registration) policies, rules, guidelines, procedures, standards, and criteria of MISO-. For the purposes of determining responsibilities and rights at a given time, the MISO Tariff, as amended in accordance with the change procedure(s) described in the MISO Tariff, in effect at the time of the performance or non-performance of an action, shall govern with respect to that action.

Section 3. Term and Termination.

- A. Term.

- (1) This Agreement is effective beginning on the Effective Date.
- (2) An SSR Agreement must not exceed a one (1) year term, except in exigent circumstances.
- (3) The "Term" of this Agreement is a period of \_\_\_\_\_; ~~twelve (12) months;~~ provided, however, that MISO, in its sole discretion, may terminate this Agreement with respect to any Unit prior to the end of the Term by giving ninety (90) at least sixty (60) days advance written notice to Participant.
- (4) The period beginning on the Start Date and ending when the Agreement terminates is called the "Full Term" of this Agreement.
- (5) An Initial Term may be extended by MISO if MISO provides at least ninety (90) days advance notice of such extension to the Participant.

B. Termination by Participant. Participant may, at its option, immediately terminate this Agreement upon the failure of MISO to continue to be certified by the Federal Energy Regulatory Commission as an RTO. ~~(“FERC” or the “Commission”)~~ as an RTO. Participant may at any time request that MISO terminate this Agreement with respect to (a) Unit 1, or (b) all Units, but the final determination remains with MISO concerning whether the Unit(s) is(are) no longer required to maintain reliability. Participant may also request that MISO terminate this Agreement in conjunction with Participant agreement, in writing, to continue to operate either (a) Unit 2 and Unit 3, or (b) all Units, without an SSR agreement until such time that the Unit(s) is(are) no longer needed to maintain the reliability of the Transmission System. In case of a decision to retire or suspend service from any Unit subsequent to its removal from SSR status pursuant to the



terms hereof, Participant shall again submit an Attachment Y notification under the MISO Tariff.

C. Effect of Termination and Survival of Terms. If this Agreement is terminated by a Party pursuant to the terms hereof with respect to any Unit, the rights and obligations of the Parties hereunder with respect to such Unit shall terminate, except that (1) the rights and obligations of the Parties that have accrued under this Agreement prior to the date of termination shall survive, and (2) the rights and obligations of the Parties relating to any Unit with respect to which this Agreement has not been terminated shall survive.

D. Notice. All notices (except for the two-hour advance notice specified in Section 7.A(2)) required to be given under this Agreement shall be in writing, and shall be deemed delivered three (3) days after being deposited in the U.S. ~~mail~~Mail, first class postage prepaid, registered (or certified) mail, return receipt requested, addressed to the other Party at the address specified in this Agreement or shall be deemed delivered on the day of receipt if sent in another manner requiring a signed receipt, such as courier delivery or Federal Express delivery. Either Party may change its address for such notices by delivering to the other Party a written notice referring specifically to this Agreement. Notices required hereunder shall be in accordance with the applicable Sections of the MISO Tariff.

If to MISO:

720 City Center Drive  
Carmel, IN 46032  
Tel. No. (317) 249-5400

If to Participant:  
*{insert information}*

Robert W. Berry  
Chief Operating Officer  
Big Rivers Electric Corporation  
201 Third Street  
P.O. Box 24  
Henderson, KY 42419-0024

Section 4. Representations, Warranties, and Covenants.

A. Participant represents, warrants, and covenants that:

- (1) Participant is duly organized, validly existing and in good standing under the laws of the jurisdiction under which it is organized, and is authorized to do business in the Commonwealth of Kentucky, including the MISO Region therein;
- (2) Participant has full power and authority to enter into this Agreement and perform all of Participant's obligations, representations, warranties, and covenants under this Agreement;
- (3) Participant's past, present and future agreements or Participant's organizational charter or bylaws, if any, or any provision of any indenture, mortgage, lien, lease, agreement, order, judgment, or decree to which Participant is a party or by which its assets or properties are bound do not materially affect performance of Participant's obligations under this Agreement;
- (4) The execution, delivery and performance of this Agreement by Participant have been duly authorized by all requisite action of its governing body;
- (5) Except as set out in an exhibit (if any) to this Agreement, MISO has not, within the twenty-four (24) months preceding the Effective Date, terminated for Default any ~~Prior Agreement~~ prior agreement with Participant, any company of which Participant is a successor in interest, or any Affiliate of Participant;

- (6) If any Defaults are disclosed on any such exhibit mentioned in subsection 4.A(5), either (a) MISO has been paid, before execution of this Agreement, all sums due to it in relation to such ~~Prior Agreement~~prior agreement, or (b) MISO, in its reasonable judgment, has determined that this Agreement is necessary for system reliability, and Participant has made alternate arrangements satisfactory to MISO for the resolution of the Default under the ~~Prior Agreement~~prior agreement with Participant, any company of which Participant is a successor in interest, or any AffiliatesAffiliate of Participant;
- (7) Participant has obtained, or will obtain prior to beginning performance under this Agreement, all licenses, registrations, certifications, permits and other authorizations and has taken, or will take prior to beginning performance under this Agreement, all actions required by applicable laws or governmental regulations except licenses, registrations, certifications, permits or other authorizations that do not materially affect performance under this Agreement;
- (8) Participant is not in violation of any laws, ordinances, or governmental rules, regulations or order of any Governmental Authority or arbitration board materially affecting performance of this Agreement and to which it is subject;
- (9) Participant is not Bankrupt, ("Bankrupt" means any of the events or occurrences described in Section 7.16.1(e) of the MISO Tariff), does not contemplate becoming Bankrupt nor, to its knowledge, will become Bankrupt;
- (10) Participant acknowledges that it has received and is familiar with the MISO Tariff; and
- (11) Participant acknowledges and affirms that the foregoing representations,

warranties, and covenants are continuing in nature throughout the ~~term~~Full Term of this Agreement. For purposes of this Section, “materially affecting performance” means resulting in a materially adverse effect on Participant’s performance of its obligations under this Agreement.

B. MISO represents, warrants, and covenants that:

- (1) MISO is the RTO certified under 18 C.F.R. §35.34 for the MISO Region and the subject Electric Generation Resource/SCU is located within the MISO Region;
- (2) MISO is duly organized, validly existing and in good standing under the laws of Delaware, and is authorized to do business in the MISO Region;
- (3) MISO has full power and authority to enter into this Agreement and perform all of MISO’s obligations, representations, warranties, and covenants under this Agreement;
- (4) MISO’s past, present and future agreements or MISO’s organizational charter or bylaws, if any, or any provision of any indenture, mortgage, lien, lease, agreement, order, judgment, or decree to which MISO is a party or by which its assets or properties are bound do not materially affect performance of MISO’s obligations under this Agreement;
- (5) The execution, delivery and performance of this Agreement by MISO have been duly authorized by all requisite action of its governing body;
- (6) MISO has obtained, or will obtain prior to beginning performance under this Agreement, all licenses, registrations, certifications, permits and other authorizations and has taken, or will take prior to beginning performance under

this Agreement, all actions required by applicable laws or governmental regulations except licenses, registrations, certifications, permits or other authorizations that do not materially affect performance under this Agreement;

- (7) MISO is not in violation of any laws, ordinances, or governmental rules, regulations or order of any Governmental Authority or arbitration board materially affecting performance of this Agreement and to which it is subject;
- (8) MISO is not Bankrupt, does not contemplate becoming Bankrupt nor, to its knowledge, will become Bankrupt; and
- (9) MISO acknowledges and affirms that the foregoing representations, warranties, and covenants are continuing in nature throughout the ~~term~~Full Term of this Agreement. For purposes of this Section, “materially affecting performance,” means resulting in a materially adverse effect on MISO’s performance of its obligations under this Agreement.

Section 5. Participant Obligations.

Participant shall comply with, and be bound by, the MISO Tariff as it pertains to the provision of SSR Service.

Section 6. MISO Obligations.

MISO shall comply with, and be bound by, all MISO Tariff provisions.

Section 7. ~~Capacity~~-Tests for SSR Units.

A. Capacity Tests for SSR Reliability.

- (1) A “Capacity Test” is a one-hour performance test of the SSR Unit by Participant<sub>2</sub>.

which shall not include a ramp-up period for the SSR Unit. The capacity as shown by a Capacity Test is called “Tested Capacity” and is determined by the applicable net meter readings during the Capacity Test.

- (2) MISO may require that a Capacity Test be run at MISO’s discretion at any time when the SSR Unit is on-line, but MISO may not require more than four (4) Capacity Tests in a contract year. MISO must give Participant at least two (2) hours advance notice, after the SSR Unit is on line, of a Capacity Test required by MISO, unless Market Participant agrees to less than two (2) hours. Participant may perform as many Capacity Tests as it desires, but Participant may not perform a Capacity Test without the prior approval of MISO, which approval MISO may not unreasonably withhold or delay. The Parties will reasonably cooperate to coordinate a Capacity Test. MISO has the right to reasonable advance notice of, and to have personnel present during, a Capacity Test.

B. Test Report. MISO shall give the Capacity Test results in writing (the “Capacity Test Report”) to Participant within twenty-four (24) hours after the test is run.

C. Effect of Capacity Test for SSR Reliability.

- (1) A determination of Tested Capacity is effective as of the beginning of the hour in which the Capacity Test is started.
- (2) For all hours in which Tested Capacity is less than SSR Capacity, (i.e., the capacity eligible for compensation), then Billing Capacity is ~~may be~~ reduced as set out in Section 9.ED below and remains so reduced until a subsequent Capacity Test establishes that Tested Capacity equals or exceeds SSR Capacity.

(3) After the Effective Date, MISO shall ~~purchase~~dispatch, as part of SSR energy, the electrical energy and/or reactive power produced by the SSR ~~Unit~~Units, including ramping energy and/or reactive power, during a Capacity Test requested by MISO, net of auxiliary equipment and other electrical requirements of the SSR ~~Unit~~Units that are supplied by the SSR ~~Unit~~Units. MISO shall also ~~purchase~~dispatch, as part of SSR energy, any electrical energy and/or reactive power produced by the SSR ~~Unit~~Units during a Capacity Test requested by Participant to attempt to show that Tested Capacity equals or exceeds SSR Capacity, net of auxiliary equipment and other electrical requirements of the SSR ~~Unit~~Units that are supplied by the SSR ~~Unit~~Units.

D. Capacity Tests for Resource Adequacy. If the SSR Unit is designated as a Capacity Resource pursuant to Module E-1 of the MISO Tariff, then the capacity test provisions of Module E-1 shall apply in addition to the Capacity Tests for System Reliability stated elsewhere in this Section 7.

E. Coordination for Other Tests. The Parties shall coordinate scheduling of any testing of the SSR Units that is required consistent with Good Utility Practice (e.g., testing in accordance with environmental and insurance requirements applicable to the Units), including the use of weekends and hours when the SSR Units are not expected to be used in order to complete the testing. During times for such testing, the SSR Units shall return to full service as dispatched by MISO (rescheduling the applicable testing) in the event of an emergency.

## Section 8. Operation.

A. Designated Unit Maintenance. Before the start of each contract year, Participant shall

furnish MISO with its proposed schedule for Generator Planned Outages for inspection, repair, maintenance, and overhaul of the Designated ~~Unit~~Units for the contract year. ~~Participant will promptly advise, in accordance with MISO's outage scheduling system, MISO of any later changes to the schedule. The specific times for~~shall approve or reject Generator Planned Outages of the Designated Unit must be approved or rejected by MISO within thirty (30) days after submission by a Participant. Requested outages shall only be rejected if necessary to assure reliability of the MISO System in accordance with MISO's Business Practices Manual. MISO shall, if requested by Participant, endeavor to accommodate changes to the schedule to the extent that reliability of the MISO System is not materially affected by those changes. In all cases, MISO must find a time for Participant to perform maintenance in a reasonable timeframe as defined by Good Utility Practice.

B. Planning Data. Participant shall timely report to MISO those items and conditions necessary for MISO's internal planning and compliance with MISO's guidelines in effect from time to time. The information supplied must include, without limitation, the following:

- (1) Availability Plan for the next day (~~transmitted to the MISO dispatcher by 6:00 a.m. of the preceding day~~), in accordance with MISO Tariff deadlines. The information submitted in the Availability Plan will be consistent with the information submitted in the Resource Plan, and shall specify each Designated Unit's availability for the next day consistent with their Resource Adequacy Requirements;
- (2) Revised Availability Plan reflecting changes in the Availability Plan as soon as



~~reasonably practical, but in no event later than sixty (60) minutes after the event that caused the change~~ accordance with MISO Tariff deadlines; and

- (3) Status of each Designated Unit with respect to Environmental Limitations, if any. ~~MISO~~Participant shall timely report to ~~Participant~~MISO the status of the Designated ~~Unit~~Units with respect to Operational Limitations.

C. Delivery.

- (1) MISO shall notify Participant of the hours and levels, if any, that the Designated ~~Unit is~~Units are to operate. ~~This information is called~~ through day-ahead commitment and real-time dispatch for system reliability. The set point in the real-time dispatch shall be considered the “Delivery Plan.” ~~MISO shall notify Participant according to the Section 4, Scheduling of the MISO Tariff.~~ ” for the purposes of this Agreement. MISO shall not notify Participant to operate at levels above those stated in the Availability Plan, and MISO shall not notify Participant to operate the SSR ~~Unit~~Units in a way that would violate the limitations on operation set out in Section 1 above. Notwithstanding the foregoing, Participant may offer its SSR Capability as described in Section 1.E into the MISO Energy & Operating Reserves Markets outside of the Delivery Plan when the SSR Units are not needed to address the reliability issues pertaining to this Agreement, consistent with Section 38.2.7(g) of the MISO Tariff. Such offers into MISO Markets shall be cost-based, including (but not limited to) Start-Up, No Load, and Energy Offers. Participant is encouraged to offer available Zonal Resource Credits into the Planning Resource Auction pursuant to the terms of the MISO Tariff.

- (2) Participant shall produce and deliver electrical energy and/or reactive power from the SSR ~~Unit~~Units to the Delivery Point at the levels specified in the Delivery Plan.
- (3) MISO may dispatch the Designated ~~Unit~~Units only when necessary to ensure transmission system security, including any emergency situation. MISO may not dispatch the Designated ~~Unit~~Units if compliance with the dispatch would cause the Designated ~~Unit~~Units to exceed the Operational and Environmental Limitations, if any, set forth in Section 1 above or at levels greater than are shown in the Availability Plan. Notwithstanding the foregoing, Participant retains the responsibility for operating the Designated ~~Unit~~Units in accordance with limits provided by applicable law.
- (4) During the hours of operation of the SSR ~~Unit~~Units specified in the Delivery Plan, Participant may only participate in the MISO Energy and Operating Reserve Markets from the SSR ~~Unit~~Units in accordance with the relevant conditions in the MISO Tariff.

Section 9. Payment Provisions.

A. For the transfer of any funds under this Agreement directly between MISO and Participant and pursuant to the Settlement procedures ~~for Ancillary Services~~ described in the MISO Tariff, the following shall apply:

- (1) Participant appoints MISO to act as its agent with respect to such funds transferred and authorizes MISO to exercise such powers and perform such duties as described in this Agreement or the MISO Tariff, together with such powers or duties as

are reasonably incidental thereto.

(2) MISO shall not have any duties, responsibilities to, or fiduciary relationship with Participant and no implied covenants, functions, responsibilities, duties, obligations or liabilities shall be read into this Agreement except as expressly set forth herein or in the MISO Tariff.

B. ~~Availability Payments~~Compensation for the SSR Unit. MISO shall ~~make availability payments~~compensate Participant according to SSR Units to ensure the SSR Unit is available to produce reactive power and, when required, real energy, as detailed in terms of Exhibit 32 to this Agreement.

C. ~~Schedule 2 Payments for SSR Unit.~~ SSR Units shall ~~recover costs associated with Reactive Supply and Voltage Control Services through Schedule 2. Schedule 2 compensation shall be provided along with other compensation to encourage parties not to Retire or Suspend SSR Units.~~

D. ~~True-Up~~Settlement Provisions for the SSR Unit. At the conclusion of each calendar ~~year~~month, MISO shall conduct an ~~annual true-up to match market and other revenues with SSR Unit annual revenue~~a settlement process for the SSR Units, consistent with the MISO Tariff requirements, in accordance with Section 38.2.7.i.

~~ED.~~ Performance-Related Payment Adjustments.

(1) For a SSR Unit, a "Misconduct Event" means any hour or hours during which Participant is requested to, but does not, deliver to MISO electrical energy and/or reactive power at a level of at least 98% on each hour (on a kilowatt-hour/hour or

MVAR/hour basis) of the level shown in the Delivery Plan.

- (2) Each day that a Misconduct Event continues after Participant receives written notice from MISO of the Misconduct Event is a separate Misconduct Event. A Misconduct Event is measured on a daily basis.
- (3) Participant is excused from the Misconduct Event payment reduction arising from any Misconduct Event that is (a) not due to intentionally incomplete, inaccurate, or dishonest reporting to MISO by Participant of the availability of the Designated Unit, or (b) caused by a failure of the MISO Transmission ~~Grid~~System.
- (4) If a Misconduct Event is not excused, then to reflect this lower-than-expected quality of firmness, MISO's payments to Participant are reduced by the Unexcused Misconduct Amount of not to exceed \$10,000 per day for all SSR units.
- (5) MISO shall inform Participant in writing of its determination if a Misconduct Event is unexcused.
- (6) MISO may offset any amounts due by Participant to MISO under this ~~Section~~ 9.Esection against any amounts due by MISO to Participant under this Agreement.
- (7) Subject to the maximum amount set forth in clause (4) above, the Unexcused Misconduct Amount reduces payments to Participant (see Exhibit 2), and is composed of two parts:
  - (a) A fixed component equal to a proportionate reduction in the Monthly SSR Payment to Participant (see Exhibit 2) according to the reduction in Billing

Capacity below the SSR Capacity, calculated for that portion of the month during which such reduction occurs. Billing Capacity is the lower of (i) the SSR Capacity and (ii) the Tested Capacity if lower than SSR Capacity for reasons not reported through the Outage Scheduler or if such reporting to MISO is intentionally incomplete, inaccurate, or dishonest.

(b) A variable component equal to the product of: (i) the difference between: a) the level shown in the Delivery Plan and b) the amount of electrical energy and/or reactive power delivered to MISO; and (ii) an SSR Unit's Hourly Ex Post LMP in any hour or hours in which a Misconduct Event occurs.

E. Compensation for Unanticipated Repairs. During the Term of this Agreement, any necessary repair or repairs to the SSR Units shall not entitle Participant to any additional compensation under this Agreement, except as provided herein. For the purposes of this Section, "unanticipated" repairs are those for which compensation is not provided for in the Annual SSR Amount contained in Exhibit 2 to this SSR Agreement. If the need arises to make an unanticipated repair to the SSR Units, Participant shall notify MISO before incurring said repair costs, together with reasonable information in support thereof. Upon such notification, MISO shall notify Participant either that: (i) it elects to exercise its rights to terminate this Agreement because the unanticipated repairs could not be accomplished in a manner that would preserve system reliability; or (ii) it agrees that Participant shall make such repairs, subject to the terms of parts 1 and 2 of this Section 9.E. In no circumstances shall the costs of repairs authorized by MISO pursuant to this Agreement be the responsibility of Participant. Participant shall not be deemed to have a Misconduct Event, nor shall Participant be subject to any other performance penalties

under this Agreement or the MISO Tariff for the period of time after Participant notifies MISO of the need for repairs as provided in this Section 9.E and MISO provides to Participant written notification that it agrees to fund the costs of such repairs and directs Participant to make such repairs.

(1) Non-Emergency Repairs. Except as provided for in part 2 of this Section 9.E, before MISO may issue a notice to fund unanticipated repairs, MISO shall make and receive approval of a Federal Power Act (“FPA”) Section 205 filing at the Commission to modify this Agreement to provide for the recovery of such repair costs and shall serve such filing on all parties to whom such repair costs would be allocated. Participant shall not make such unanticipated repairs unless and until MISO informs Participant in writing that it has received FERC approval to modify this Agreement to provide for the recovery of such costs.

(2) Emergency Repairs. If MISO reasonably believes that system security and reliability require any unanticipated repairs to be made before FERC can act on a Section 205 filing (“Emergency Repairs”), then MISO shall so notify Participant in writing and direct Participant to make such Emergency Repairs and MISO shall make a Section 205 filing at FERC as soon as reasonably practicable thereafter to modify this Agreement to provide for recovery of such repair costs. In the case of Emergency Repairs, if FERC later determines MISO’s decision to approve such Emergency Repairs was imprudent or otherwise does not accept such modifications to the Agreement, then the costs of the Emergency Repairs shall be allocated pursuant to Section 38.2.7.k of the MISO Tariff (as filed in FERC Docket No. ER12-2302 on December 18, 2012).

F. Allocation of SSR Compensation. MISO will charge the LSEs that benefit from operation of the subject SSR Units in accordance with MISO Tariff Schedule 43F.

Section 10. Default.

A. Event of Default.

- (1) Failure to make payment or transfer funds as provided in the MISO Tariff shall constitute a material breach and shall constitute an event of default ("Default") unless cured within three (3) Business Days after delivery by the non-breaching Party of written notice of the failure to the breaching Party. Provided further that if such a material breach, regardless of whether such breach is cured within the allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth such breach shall constitute a Default by the breaching Party.
- (2) For any material breach other than a failure to make payment or transfer funds, the occurrence and continuation of any of the following events shall constitute an event of Default by Participant:
  - (a) Except as excused under subsection (4) or (5) below, a material breach, other than a failure to make payment or transfer funds, of this Agreement by Participant, including any material failure by Participant to comply with the MISO Tariff, unless cured within fourteen (14) Business Days after delivery by MISO of written notice of the material breach to Participant. Participant must begin work or other efforts within three (3) Business Days to cure such material breach after delivery by MISO of

written notice of such material breach by Participant and must prosecute such work or other efforts with reasonable diligence, consistent with Good Utility Practice, until the breach is cured. Provided further that if a material breach, regardless of whether such breach is cured within the allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth (4th) such breach shall constitute a Default.

- (b) Participant becomes Bankrupt, except for the filing of a petition in involuntary bankruptcy, or similar involuntary proceedings that is dismissed within ninety (90) days thereafter.
  - (c) The Designated Unit's operation is abandoned without intent to return it to operation during the Full Term; or
  - (d) Three or more unexcused Misconduct Events occur during a contract year.
- (3) Except as excused under subsection (4) or (5) below, a material breach of this Agreement by MISO, including any material failure by MISO to comply with the MISO Tariff, other than a failure to make payment or transfer funds, shall constitute a Default by MISO unless cured within fourteen (14) Business Days after delivery by Participant of written notice of the material breach to MISO. MISO must begin work or other efforts within three (3) Business Days to cure such material breach after delivery by Participant of written notice of such material breach by MISO and must prosecute such work or other efforts with reasonable diligence, consistent with Good Utility Practice, until the breach is cured. Provided further that if a material breach, regardless of whether such



breach is cured within the allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth such breach shall constitute a Default.

- (4) For any material breach other than a failure to make payment or transfer funds, the breach shall not result in a Default if the breach cannot reasonably be cured within fourteen (14) calendar days, prompt written notice is provided by the breaching Party to the other Party, and the breaching Party began work or other efforts to cure the breach within three (3) Business Days after delivery of the notice to the breaching Party and prosecutes the curative work or efforts with reasonable diligence, consistent with Good Utility Practice, until the curative work or efforts are completed.
- (5) If, due to a Force Majeure Event, a Party is in breach with respect to any obligation hereunder, such breach shall not result in a Default by that Party.

B. Remedies for Default.

- (1) MISO's Remedies for Default. In the event of a Default by Participant, MISO may pursue any remedies MISO has under this Agreement, at law, or in equity, subject to the provisions of Section 12: Dispute Resolution of this Agreement. In the event of a Default by Participant, if the MISO Tariff does not specify a remedy for a particular Default, MISO may, at its option, upon written notice to Participant, immediately terminate this Agreement, with termination to be effective upon the date of delivery of notice.
- (2) Participant's Remedies for Default.

- (a) Unless otherwise specified in this Agreement or in the MISO Tariff, and subject to the provisions of Section 12: Dispute Resolution of this Agreement, in the event of a Default by MISO, Participant's remedies shall be limited to:
- (i) Immediate termination of this Agreement upon written notice to MISO,
  - (ii) Monetary recovery in accordance with the Settlement procedures set forth in the MISO Tariff, and
  - (iii) Specific performance.
- (b) However, in the event of a material breach by MISO of any of its representations, warranties or covenants, Participant's sole remedy shall be immediate termination of this Agreement upon written notice to MISO.
- (c) If as a final result of any dispute resolution MISO, as the settlement agent, is determined to have over-collected from a Market Participant(s), with the result that refunds are owed by Participant to MISO, as the settlement agent such Market Participant(s) may request MISO to allow such Market Participant to proceed directly against Participant, in lieu of receiving full payment from MISO. In the event of such request, MISO, in its sole discretion, may agree to assign to such Market Participant MISO's rights to seek refunds from Participant, and Participant shall be deemed to have consented to such assignment. This subsection (c) shall survive termination of this Agreement.

- (3) A Default or breach of this Agreement by a Party shall not relieve either Party of the obligation to comply with the MISO Tariff.

C. Force Majeure.

- (1) If, due to a Force Majeure Event, either Party is in breach of this Agreement with respect to any obligation hereunder, such Party shall take reasonable steps, consistent with Good Utility Practice, to remedy such breach. If either Party is unable to fulfill any obligation by reason of a Force Majeure Event, it shall give notice and the full particulars of the obligations affected by such Force Majeure Event to the other Party in writing or by telephone (if followed by written notice) as soon as reasonably practicable, but not later than fourteen (14) calendar days, after such Party becomes aware of the event. A failure to give timely notice of the Force Majeure event shall constitute a waiver of the claim of Force Majeure Event. The Party experiencing the Force Majeure Event shall also provide notice, as soon as reasonably practicable, when the Force Majeure Event ends.
- (2) Notwithstanding the foregoing, a Force Majeure Event does not relieve a Party affected by a Force Majeure Event of its obligation to make payments or of any consequences of non-performance pursuant to the MISO Tariff or under this Agreement, except that the excuse from Default provided by subsection 10.A(5) above is still effective.

- D. Duty to Mitigate. Except as expressly provided otherwise herein, each Party shall use commercially reasonable efforts to mitigate any damages it may incur as a result of the other Party's performance or non-performance of this Agreement.

Section 11. Limitation of Damages and Liability and Indemnification.

- A. EXCEPT AS EXPRESSLY LIMITED IN THIS AGREEMENT OR MISO BUSINESS PRACTICES, MISO OR PARTICIPANT MAY SEEK FROM THE OTHER, THROUGH APPLICABLE DISPUTE RESOLUTION PROCEDURES SET FORTH IN MISO PROTOCOLS, ANY MONETARY DAMAGES OR OTHER REMEDY OTHERWISE ALLOWABLE UNDER INDIANA LAW, AS DAMAGES FOR DEFAULT OR BREACH OF THE OBLIGATIONS UNDER THIS AGREEMENT; PROVIDED, HOWEVER, THAT NEITHER PARTY IS LIABLE TO THE OTHER FOR ANY SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES OR INJURY THAT MAY OCCUR, IN WHOLE OR IN PART, AS A RESULT OF A DEFAULT UNDER THIS AGREEMENT, A TORT, OR ANY OTHER CAUSE, WHETHER OR NOT A PARTY HAD KNOWLEDGE OF THE CIRCUMSTANCES THAT RESULTED IN THE SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES OR INJURY, OR COULD HAVE FORESEEN THAT SUCH DAMAGES OR INJURY WOULD OCCUR.
- B. The Parties have expressly agreed that, other than subsections A and B of this Section, this Agreement shall not include any other limitations of liability or indemnification provisions, and that such issues shall be governed solely by applicable law, in a manner consistent with the Choice of Law and Venue subsection 13.A of this Agreement, regardless of any contrary provisions that may be included in or subsequently added to the MISO Tariff (outside of this Agreement).

Section 12. Dispute Resolution.

- A. In the event of a dispute, including a dispute regarding a Default, under this Agreement,

Parties to this Agreement shall first attempt resolution of the dispute using the applicable dispute resolution procedures set forth in the MISO Tariff.

- B. In the event of a dispute, including a dispute regarding a Default, under this Agreement, each Party shall bear its own costs and fees, including, but not limited to attorneys' fees, court costs, and its share of any mediation or arbitration fees.

Section 13. Miscellaneous.

- A. Choice of Law and Venue. Notwithstanding anything to the contrary in this Agreement, this Agreement shall be deemed entered into in ~~Delaware~~Indiana and, with the exception of matters governed exclusively by federal law, shall be governed by and construed and interpreted in accordance with the laws of the State of ~~Delaware~~Indiana that apply to contracts executed in and performed entirely within the State of ~~Delaware~~Indiana, without reference to any rules of conflict of laws. Neither Party waives primary jurisdiction as a defense; provided that any court suits regarding this Agreement shall be brought in a state or federal court located within ~~Delaware~~Indiana, and the Parties hereby waive any defense of *forum non-conveniens*.

- B. Assignment.

- (1) Notwithstanding anything herein to the contrary, a Party shall not assign or otherwise transfer all or any of its rights or obligations under this Agreement without the prior written consent of the other Party, which shall not be unreasonably withheld or delayed, except that a Party may assign or transfer its rights and obligations under this Agreement without the prior written consent of the other Party (if neither the assigning Party or the assignee is then in Default of

any Agreement with MISO):

- (a) Where any such assignment or transfer is to an Affiliate of the Party; or
- (b) Where any such assignment or transfer is to a successor to or transferee of the direct or indirect ownership or operation of all or part of the Party, or its facilities; or
- (c) For collateral security purposes to aid in providing financing for itself, provided that the assigning Party will ~~require any secured party, trustee or mortgagee to notify~~ the other Party of any such assignment. ~~Any financing arrangement entered into by either Party pursuant to this Section will provide that prior~~Prior to or upon the exercise of the secured party's, trustee's or mortgagee's assignment rights pursuant to said arrangement entered into by either Party pursuant to this Section, the assigning Party, the secured creditor, the trustee or mortgagee will notify the other Party of the date and particulars of any such exercise of assignment right(s). If requested by the Party making any such collateral assignment to a Financing Person, secured party, trustee or mortgagee (any such secured party, trustee, or mortgagee is hereinafter referred to as a "Financing Person"), the other Party shall execute and deliver a consent to such assignment containing customary provisions, including representations as to corporate authorization, enforceability of this Agreement and absence of known Defaults, notices of Default, and an opportunity for the Financing Person to cure Defaults.

- (2) An assigning Party shall provide prompt written notice of the assignment to the

other Party. Any attempted assignment that violates this Section is void and ineffective. Any assignment under this Agreement shall not relieve either Party of its obligations under this Agreement, nor shall either Party's obligations be enlarged, in whole or in part, by reason thereof.

- C. No Third Party Beneficiary. Except with respect to the rights of other Market Participants in Section 10.B and the Financing Persons in Section 13.B, (1) nothing in this Agreement nor any action taken hereunder shall be construed to create any duty, liability or standard of care to any third party, (2) no third party shall have any rights or interest, direct or indirect, in this Agreement or the services to be provided hereunder and (3) this Agreement is intended solely for the benefit of the Parties, and the Parties expressly disclaim any intent to create any rights in any third party as a third-party beneficiary to this Agreement or the services to be provided hereunder. Nothing in this Agreement shall create a contractual relationship between one Party and the customers of the other Party, nor shall it create a duty of any kind to such customers.
- D. No Waiver. Parties shall not be required to give notice to enforce strict adherence to all provisions of this Agreement. No breach or provision of this Agreement shall be deemed waived, modified or excused by a Party unless such waiver, modification or excuse is in writing and signed by an authorized officer of such Party. The failure by or delay of either Party in enforcing or exercising any of its rights under this Agreement shall (1) not be deemed a waiver, modification or excuse of such right or of any breach of the same or different provision of this Agreement, and (2) not prevent a subsequent enforcement or exercise of such right. Each Party shall be entitled to enforce the other Party's covenants and promises contained herein, notwithstanding the existence of any claim or cause of

action against the enforcing Party under this Agreement or otherwise.

E. Headings. Titles and headings of paragraphs and sections within this Agreement are provided merely for convenience and shall not be used or relied upon in construing this Agreement or the Parties' intentions with respect thereto.

F. Severability. In the event that any of the provisions, or portions or applications thereof, of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, that determination shall not affect the enforceability or validity of the remaining portions of this Agreement, and this Agreement shall continue in full force and effect as if it had been executed without the invalid provision; provided, however, if either Party determines, in its sole discretion, that there is a material change in this Agreement by reason thereof, the Parties shall promptly enter into negotiations to replace the unenforceable or invalid provision with a valid and enforceable provision. If the Parties are not able to reach an agreement as the result of such negotiations within fourteen (14) days, either Party shall have the right to terminate this Agreement on three (3) days written notice.

EG. Entire Agreement. Any ~~Exhibit~~exhibits attached to this Agreement are incorporated into this Agreement by reference and made a part of this Agreement as if repeated verbatim in this Agreement. This Agreement represents the Parties' final and mutual understanding with respect to its subject matter. It replaces and supersedes any prior agreements or understandings, whether written or oral. No representations, inducements, promises, or agreements, oral or otherwise, have been relied upon or made by any Party, or anyone on behalf of a Party, that are not fully expressed in this Agreement. An agreement, statement, or promise not contained in this Agreement is not valid or binding.



FH. Amendment. The standard form of this Agreement may only be modified through the procedure for modifying MISO's the MISO Tariff described in the MISO Tariff. Any changes to the terms of the standard form of this Agreement shall not take effect until a new Agreement is executed between the Parties.

GI. MISO's Right to Audit Participant. Participant shall keep detailed records for a period of three years of all activities under this Agreement giving rise to any information, statement, charge, payment or computation delivered to MISO under the MISO Tariff. Such records shall be retained and shall be available for audit or examination by MISO as hereinafter provided. MISO has the right during Business Hours and upon reasonable written notice and reasonable cause to examine the records of Participant as necessary to verify the accuracy of any such information, statement, charge, payment or computation made under this Agreement. If any such examination reveals any inaccuracy in any information, statement, charge, payment or computation, the necessary adjustments in such information, statement, charge, payment, computation, or procedures used in supporting its ongoing accuracy will be promptly made.

HJ. Participant's Right to Audit MISO. Participant's right to data and audit of MISO shall be as described in the MISO Tariff and shall not exceed the rights described in the MISO Tariff.

HK. Further Assurances. Each Party agrees that during the term of this Agreement it will take such actions, provide such documents, do such things and provide such further assurances as may reasonably be requested by the other Party to permit performance of this Agreement.

JL. Conflicts. This Agreement is subject to applicable federal, state, and local laws,

ordinances, rules, regulations, orders of any Governmental Authority and tariffs. Nothing in this Agreement may be construed as a waiver of any right to question or contest any federal, state and local law, ordinance, rule, regulation, order of any Governmental Authority, or tariff. In the event of a conflict between this Agreement and an applicable federal, state, and local law, ordinance, rule, regulation, order of any Governmental Authority or tariff, the applicable federal, state, and local law, ordinance, rule, regulation, order of any Governmental Authority or tariff shall prevail, provided that Participant shall give notice to MISO of any such conflict affecting Participant. In the event of a conflict between the MISO Tariff and this Agreement, the provisions expressly set forth in this Agreement shall control.

KM. No Partnership. This Agreement may not be interpreted or construed to create an association, joint venture, or partnership between the Parties or to impose any partnership obligation or liability upon either Party. Neither Party has any right, power, or authority to enter any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party except as provided in Section 9.A.

LN. No State Public Utility Created. This Agreement may not be interpreted or construed as modifying the jurisdictional status of MISO, including, but not limited to establishment of MISO as a state public utility under the laws of any jurisdiction, as a result of MISO's performance under this Agreement.

MO. Construction. In this Agreement, the following rules of construction apply, unless expressly provided otherwise or unless the context clearly requires otherwise:

(1) The singular includes the plural, and the plural includes the singular.

- (2) The present tense includes the future tense, and the future tense includes the present tense.
- (3) Words importing any gender include the other gender.
- (4) The word “shall” denotes a duty.
- (5) The word “must” denotes a condition precedent or subsequent.
- (6) The word “may” denotes a privilege or discretionary power.
- (7) The phrase “may not” denotes a prohibition.
- (8) References to statutes, tariffs, regulations or the MISO Tariff include all provisions consolidating, amending, or replacing the statutes, tariffs, regulations or the MISO Tariff referred to.
- (9) References to “writing” include printing, typing, lithography, and other means of reproducing words in a tangible visible form.
- (10) The words “including,” “includes,” and “include” are deemed to be followed by the words “without limitation.”
- (11) Any reference to a day, week, month or year is to a calendar day, week, month or year unless otherwise indicated.
- (12) References to Articles, Sections (or subdivisions of Sections), Exhibits, annexes or schedules are to this Agreement, unless expressly stated otherwise.
- (13) Unless expressly stated otherwise, references to agreements, the MISO Tariff and other contractual instruments include all subsequent amendments and other modifications to the instruments, but only to the extent the amendments and other

modifications are not prohibited by this Agreement.

- (14) References to persons or entities include their respective successors and permitted assigns and, for governmental entities, entities succeeding to their respective functions and capacities.
- (15) References to time are to Eastern Standard Time.
- (16) References to any capitalized workword or phrase not defined herein shall have the meanings from the MISO Tariff.

NP. Multiple Counterparts. This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

SIGNED, ACCEPTED AND AGREED TO by each undersigned signatory who, by signature hereto, represents and warrants that he or she has full power and authority to execute this Agreement.

*Midcontinent Independent System Operator, Inc.:*

By: \_\_\_\_\_

Name: \_\_\_\_\_ Stephen Kozey

Title: \_\_\_\_\_ Sr. Vice President and General Counsel

Date: \_\_\_\_\_ November 1, 2013

*Participant:*

By: \_\_\_\_\_

Name: \_\_\_\_\_ Mark A. Bailey

Title: \_\_\_\_\_ President and Chief Executive Officer

Date: \_\_\_\_\_ November 1, 2013

EXHIBIT 1

Detailed Description of SSR Units

Coleman Generating Station

Unit Nos. 1-3

*~~{Describe Generation Unit/SCU more specifically}~~*

4982 River Road

Hawesville, KY 42348

UNIT DESCRIPTION

Initial service date – Unit 1 (1969); Unit 2 (1970); Unit 3 (1971)

Coal Fired Steam Boiler

Bituminous Coal Fueled

## EXHIBIT 2

### Description of SSR Unit Going-Forward Compensation

~~[Describe how the costs that will be paid to the owner or operator of the SSR Unit will be calculated.]~~ **A. Fixed Component of Compensation**

Pursuant to Section 9 of the Agreement, MISO shall pay Participant a Monthly SSR Payment of \$3,414,502 for Units 1-3, representing monthly allocations of budgeted fixed costs from an Annual SSR Amount for all Units to each month during the term of the SSR Agreement. If (i) this Agreement is terminated with respect to Unit 1 and (ii) Units 2 and 3 remain SSR Units, MISO shall pay Participant a Monthly SSR Payment of \$2,250,936, representing monthly allocations of budgeted fixed costs from an Annual SSR Amount for Units 2-3 to each month during the term of the SSR Agreement. Each such Monthly SSR Payment shall be made regardless of dispatch of the SSR Unit during that month. If this SSR Agreement is terminated for any Unit, effective during the course of a calendar month, then the corresponding Monthly SSR Payment shall be prorated for that month.

The MISO payment to Participant is subject to true up for the SSR Units based upon the actual costs incurred by Participant in operating the SSR Units, which shall be settled within 55 days after the last day of the month for each month of the Agreement. For the completion of the true up calculations, Participant shall submit the actual costs to MISO such that the information is received by MISO within 50 days after the last day of the month for each month of the Agreement. Such submissions to MISO shall be sent to MISO at the address stated in Section 3.D of this Agreement, to the attention of the Manager of Market Settlements. Both Parties acknowledge that actual costs under this Agreement may be larger or smaller than the agreed upon (budgeted) Monthly SSR Amount for each Unit. Actual plant O&M and maintenance capital costs sustained in

accordance with Good Utility Practice and any unit operational requirements dictated under the terms of this agreement will form the basis for the trued up amount paid or charged to Participant by MISO.

The compensation provided for under this Agreement may be further modified pursuant to Section 7 (adjustment to Monthly SSR Payment based on Capacity Tests) and/or Section 9.D (“Performance-Related Payment Adjustments) and/or Section 9.E (“Compensation for Unanticipated Repairs”) of the Agreement. Compensation shall be settled on a monthly basis.

**B. Variable Component of Compensation**

Pursuant to Section 9 of the Agreement, MISO shall pay Participant its Production Cost for the amount of Actual Energy Injections (as defined in Module A Section 1.1a of the MISO Tariff) and Operating Reserve Cost in each instance that MISO dispatches the SSR Unit. For purposes of this Agreement, “Production Cost” shall mean the Energy output cost of the SSR Unit based upon Start Up, No Load, and Energy Offer cost components that reflect the actual costs of physically operating the SSR Unit, and “Operating Reserve Cost” shall mean the actual cost to provide Operating Reserves. All Production Costs and Operating Reserve Costs will be subject to audit by MISO, and will be subject to audit and enforcement by the Independent Market Monitor (“IMM”) (such audit and enforcement provision shall not be interpreted as a limitation on MISO and IMM activities or responsibilities).

Through the MISO settlement process, MISO will ensure that Participant is paid the “SSR Unit Compensation,” which is equal to the sum of Production Cost and Operating Reserve Cost over all the SCUC Instructed Hours of Operation in the Day for that SSR Unit. MISO will compare the SSR Unit Compensation to the “SSR Unit Energy and Operating Reserve Credit.” The SSR Unit Energy and Operating Reserve Credit are those charges and credits calculated



pursuant to Sections 39.3 Day-Ahead Energy and Operating Reserve Market and 40.3 Real Time Energy and Operating Reserve Market Settlement of the MISO Tariff, plus any revenues from Schedule 2 associated with the SSR Unit or from Planning Resource designation and any charges assessed through Schedule 17 and Schedule 24. In those hours where the SSR Unit Compensation is greater than the SSR Unit Energy and Operating Reserve Credit, MISO will make the applicable make-whole payment to Participant (such make-whole payment to be equal to the difference between the SSR Unit Compensation and the SSR Unit Energy and Operating Reserve Credit). In those hours where the SSR Unit Compensation is less than the SSR Unit Energy and Operating Reserve Credit, MISO will debit from Participant (such debit to be equal to the difference between the SSR Unit Energy and Operating Reserve Credit and the SSR Unit Compensation).

**SA 6505 BIG RIVERS ELECTRIC - COLEMAN SSR Version 0.0.0 Effective 9/1/2013**

**Original Service Agreement No. 6505**

**ATTACHMENT Y-1**

**Standard Form System Support Resource (“SSR”) Agreement**

**Between**

**Big Rivers Electric Corporation**

**and**

**Midcontinent Independent System Operator, Inc.**

***ATTACHMENT Y-1 Standard Form System Support Resource (SSR) Agreement Version:***

***4.0.0 Effective: 6/1/2013***

**ATTACHMENT Y-1**

**Standard Form System Support Resource (“SSR”) Agreement**

**Between**

**Big Rivers Electric Corporation**

**and**

**Midcontinent Independent System Operator, Inc.**

This SSR Agreement (“Agreement”), effective as of the 1<sup>st</sup> of September, 2013 (“Effective Date”), is entered into by and between Big Rivers Electric Corporation, a generation and transmission cooperative located in the Commonwealth of Kentucky (“Participant”) and Midcontinent Independent System Operator, Inc. (“MISO,” collectively with Participant, the “Parties”).

Recitals

WHEREAS:

- A. Participant owns or operates one or more Electric Generation Resources or a Synchronous Condenser Unit (“SCU”) as defined in the MISO Tariff, and MISO requires Participant to supply service in the MISO Transmission Provider region (“MISO Region”) in order to maintain the reliability of the Transmission System;
- B. MISO is the Regional Transmission Organization (“RTO”) for the MISO Region; and
- C. The Parties enter into this Agreement in order to establish the terms and conditions by which MISO and Participant will discharge their respective duties and responsibilities under the MISO Tariff.

Agreements

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, the Parties hereby agree as follows:

Section 1. Unit-Specific Terms.

- A. Start Date: September 1, 2013.
- B. Start Time:   000 Hrs.
- C. Unit:  Coleman Generating Station Units 1-3 (“Unit 1,” “Unit 2,” and “Unit 3”); provided, however, that “Unit” or “Units” shall not include any Unit with respect to which this Agreement is terminated pursuant to the terms hereof.

The units described above may also be referred to as the “Designated Units” or “Units” or “SSR Units” (or in the singular in reference to an individual unit) in this Agreement.

- D. Description of Units: Coleman Generating Station Units 1-3, located in Hawesville, Kentucky, as may be described in more detail on Exhibit 1 attached hereto.
- E. Name Plate Information  
SSR Unit
  - (a) SSR Capacity in MW: 443 MW (150 for Unit 1; 138 for Unit 2; 155 for Unit 3)
  - (b) Power Factor Lagging
    - (i) 0.85 (Unit 1 & Unit 2); 0.90 (Unit 3) P.F. (at Generator Main Leads)
    - (ii) N/A        P.F. (at high side of Main Power Transformer)

(c) Power Factor Leading

(i) 0.85 (Unit 1 & Unit 2); 0.90 (Unit 3) P.F. (at Generator Main Leads)

(ii) N/A\_\_ P.F. (at high side of Main Power Transformer)

F. Delivery Points: BREC.COLE1; BREC.COLE2; BREC.COLE3

G. Revenue Meter Location (Use Resource IDs): N/A

H. Operational and Environmental Limitations (check and describe all that apply):

SSR Unit:

(a) Operational

Maximum annual hours of operation: \_\_\_\_\_

Maximum annual MWh: \_\_\_\_\_

Maximum annual starts: \_\_\_\_\_

Other: Maximum of one (1) start per week, per unit

(b) Environmental

Maximum annual NO<sub>x</sub> emissions: \_\_\_\_\_

Maximum annual SO<sub>2</sub> emissions: 5.2 lbs/MMBTU daily average for each unit (Unit 1, Unit 2, and Unit 3)

Other: Particulate limit of 0.27 lbs/MMBTU (3 hr. avg.) for each unit (Unit 1, Unit 2, and Unit 3); Trigger opacity limits of 72% (duct), 23.6% (bypass) for Unit 1; 62% (duct), 19.8% (bypass) for Unit 2; and 67% (duct), 22.0% (bypass) for Unit 3

Section 2. Definitions.

- A. Unless herein defined, all definitions and acronyms found in the MISO Tariff shall be incorporated by reference into this Agreement.
- B. “MISO Tariff” shall mean the document adopted by MISO, including any attachments or exhibits referenced in that document, as amended from time to time, that contains the scheduling, operating, planning, reliability, and settlement (including customer registration) policies, rules, guidelines, procedures, standards, and criteria of MISO. For the purposes of determining responsibilities and rights at a given time, the MISO Tariff, as amended in accordance with the change procedure(s) described in the MISO Tariff, in effect at the time of the performance or non-performance of an action, shall govern with respect to that action.

Section 3. Term and Termination.

A. Term.

- (1) This Agreement is effective beginning on the Effective Date.
- (2) An SSR Agreement must not exceed a one (1) year term, except in exigent circumstances.
- (3) The “Term” of this Agreement is a period of twelve (12) months; provided, however, that MISO, in its sole discretion, may terminate this Agreement with respect to any Unit prior to the end of the Term by giving at least sixty (60) days advance written notice to Participant.
- (4) The period beginning on the Start Date and ending when the Agreement terminates is called the “Full Term” of this Agreement.

(5) An Initial Term may be extended by MISO if MISO provides at least ninety (90) days advance notice of such extension to the Participant.

- B. Termination by Participant. Participant may, at its option, immediately terminate this Agreement upon the failure of MISO to continue to be certified by the Federal Energy Regulatory Commission (“FERC” or the “Commission”) as an RTO. Participant may at any time request that MISO terminate this Agreement with respect to (a) Unit 1, or (b) all Units, but the final determination remains with MISO concerning whether the Unit(s) is(are) no longer required to maintain reliability. Participant may also request that MISO terminate this Agreement in conjunction with Participant agreement, in writing, to continue to operate either (a) Unit 2 and Unit 3, or (b) all Units, without an SSR agreement until such time that the Unit(s) is(are) no longer needed to maintain the reliability of the Transmission System. In case of a decision to retire or suspend service from any Unit subsequent to its removal from SSR status pursuant to the terms hereof, Participant shall again submit an Attachment Y notification under the MISO Tariff.
- C. Effect of Termination and Survival of Terms. If this Agreement is terminated by a Party pursuant to the terms hereof with respect to any Unit, the rights and obligations of the Parties hereunder with respect to such Unit shall terminate, except that (1) the rights and obligations of the Parties that have accrued under this Agreement prior to the date of termination shall survive and (2) the rights and obligations of the Parties relating to any Unit with respect to which this Agreement has not been terminated shall survive.
- D. Notice. All notices (except for the two-hour advance notice specified in Section 7.A(2)) required to be given under this Agreement shall be in writing, and shall be deemed delivered three (3) days after being deposited in the U.S. Mail, first class postage prepaid,

registered (or certified) mail, return receipt requested, addressed to the other Party at the address specified in this Agreement or shall be deemed delivered on the day of receipt if sent in another manner requiring a signed receipt, such as courier delivery or Federal Express delivery. Either Party may change its address for such notices by delivering to the other Party a written notice referring specifically to this Agreement. Notices required hereunder shall be in accordance with the applicable Sections of the MISO Tariff.

If to MISO:

720 City Center Drive  
Carmel, IN 46032  
Tel. No. (317) 249-5400

If to Participant:

Robert W. Berry  
Chief Operating Officer  
Big Rivers Electric Corporation  
201 Third Street  
P.O. Box 24  
Henderson, KY 42419-0024

Section 4. Representations, Warranties, and Covenants.

A. Participant represents, warrants, and covenants that:

- (1) Participant is duly organized, validly existing and in good standing under the laws of the jurisdiction under which it is organized, and is authorized to do business in the Commonwealth of Kentucky, including the MISO Region therein;
- (2) Participant has full power and authority to enter into this Agreement and perform all of Participant's obligations, representations, warranties, and covenants under this Agreement;
- (3) Participant's past, present and future agreements or Participant's organizational charter or bylaws, if any, or any provision of any indenture, mortgage, lien, lease,



agreement, order, judgment, or decree to which Participant is a party or by which its assets or properties are bound do not materially affect performance of Participant's obligations under this Agreement;

- (4) The execution, delivery and performance of this Agreement by Participant have been duly authorized by all requisite action of its governing body;
- (5) Except as set out in an exhibit (if any) to this Agreement, MISO has not, within the twenty-four (24) months preceding the Effective Date, terminated for Default any prior agreement with Participant, any company of which Participant is a successor in interest, or any Affiliate of Participant;
- (6) If any Defaults are disclosed on any such exhibit mentioned in subsection 4.A(5), either (a) MISO has been paid, before execution of this Agreement, all sums due to it in relation to such prior agreement, or (b) MISO, in its reasonable judgment, has determined that this Agreement is necessary for system reliability, and Participant has made alternate arrangements satisfactory to MISO for the resolution of the Default under the prior agreement with Participant, any company of which Participant is a successor in interest, or any Affiliate of Participant;
- (7) Participant has obtained, or will obtain prior to beginning performance under this Agreement, all licenses, registrations, certifications, permits and other authorizations and has taken, or will take prior to beginning performance under this Agreement, all actions required by applicable laws or governmental regulations except licenses, registrations, certifications, permits or other authorizations that do not materially affect performance under this Agreement;

- (8) Participant is not in violation of any laws, ordinances, or governmental rules, regulations or order of any Governmental Authority or arbitration board materially affecting performance of this Agreement and to which it is subject;
- (9) Participant is not Bankrupt (“Bankrupt” means any of the events or occurrences described in Section 7.16.1(e) of the MISO Tariff), does not contemplate becoming Bankrupt nor, to its knowledge, will become Bankrupt;
- (10) Participant acknowledges that it has received and is familiar with the MISO Tariff; and
- (11) Participant acknowledges and affirms that the foregoing representations, warranties, and covenants are continuing in nature throughout the Full Term of this Agreement. For purposes of this Section, “materially affecting performance” means resulting in a materially adverse effect on Participant’s performance of its obligations under this Agreement.

B. MISO represents, warrants, and covenants that:

- (1) MISO is the RTO certified under 18 C.F.R. §35.34 for the MISO Region and the subject Electric Generation Resource/SCU is located within the MISO Region;
- (2) MISO is duly organized, validly existing and in good standing under the laws of Delaware, and is authorized to do business in the MISO Region;
- (3) MISO has full power and authority to enter into this Agreement and perform all of MISO’s obligations, representations, warranties, and covenants under this Agreement;
- (4) MISO’s past, present and future agreements or MISO’s organizational charter or

bylaws, if any, or any provision of any indenture, mortgage, lien, lease, agreement, order, judgment, or decree to which MISO is a party or by which its assets or properties are bound do not materially affect performance of MISO's obligations under this Agreement;

- (5) The execution, delivery and performance of this Agreement by MISO have been duly authorized by all requisite action of its governing body;
- (6) MISO has obtained, or will obtain prior to beginning performance under this Agreement, all licenses, registrations, certifications, permits and other authorizations and has taken, or will take prior to beginning performance under this Agreement, all actions required by applicable laws or governmental regulations except licenses, registrations, certifications, permits or other authorizations that do not materially affect performance under this Agreement;
- (7) MISO is not in violation of any laws, ordinances, or governmental rules, regulations or order of any Governmental Authority or arbitration board materially affecting performance of this Agreement and to which it is subject;
- (8) MISO is not Bankrupt, does not contemplate becoming Bankrupt nor, to its knowledge, will become Bankrupt; and
- (9) MISO acknowledges and affirms that the foregoing representations, warranties, and covenants are continuing in nature throughout the Full Term of this Agreement. For purposes of this Section, "materially affecting performance," means resulting in a materially adverse effect on MISO's performance of its obligations under this Agreement.

Section 5. Participant Obligations.

Participant shall comply with, and be bound by, the MISO Tariff as it pertains to the provision of SSR Service.

Section 6. MISO Obligations.

MISO shall comply with, and be bound by, all MISO Tariff provisions.

Section 7. Tests for SSR Units.

A. Capacity Tests for SSR Reliability.

- (1) A “Capacity Test” is a one-hour performance test of the SSR Unit by Participant, which shall not include a ramp-up period for the SSR Unit. The capacity as shown by a Capacity Test is called “Tested Capacity” and is determined by the applicable net meter readings during the Capacity Test.
- (2) MISO may require that a Capacity Test be run at MISO’s discretion at any time when the SSR Unit is on-line, but MISO may not require more than four (4) Capacity Tests in a contract year. MISO must give Participant at least two (2) hours advance notice, after the SSR Unit is on line, of a Capacity Test required by MISO, unless Market Participant agrees to less than two (2) hours. Participant may perform as many Capacity Tests as it desires, but Participant may not perform a Capacity Test without the prior approval of MISO, which approval MISO may not unreasonably withhold or delay. The Parties will reasonably cooperate to coordinate a Capacity Test. MISO has the right to reasonable advance notice of, and to have personnel present during, a Capacity Test.

B. Test Report. MISO shall give the Capacity Test results in writing (the “Capacity Test

Report”) to Participant within twenty-four (24) hours after the test is run.

C. Effect of Capacity Test for SSR Reliability.

- (1) A determination of Tested Capacity is effective as of the beginning of the hour in which the Capacity Test is started.
- (2) For all hours in which Tested Capacity is less than SSR Capacity (*i.e.*, the capacity eligible for compensation), then Billing Capacity may be reduced as set out in Section 9.D below and remains so reduced until a subsequent Capacity Test establishes that Tested Capacity equals or exceeds SSR Capacity.
- (3) After the Effective Date, MISO shall dispatch, as part of SSR energy, the electrical energy and/or reactive power produced by the SSR Units, including ramping energy and/or reactive power, during a Capacity Test requested by MISO, net of auxiliary equipment and other electrical requirements of the SSR Units that are supplied by the SSR Units. MISO shall also dispatch, as part of SSR energy, any electrical energy and/or reactive power produced by the SSR Units during a Capacity Test requested by Participant to attempt to show that Tested Capacity equals or exceeds SSR Capacity, net of auxiliary equipment and other electrical requirements of the SSR Units that are supplied by the SSR Units.

D. Capacity Tests for Resource Adequacy. If the SSR Unit is designated as a Capacity Resource pursuant to Module E-1 of the MISO Tariff, then the capacity test provisions of Module E-1 shall apply in addition to the Capacity Tests for System Reliability stated elsewhere in this Section 7.

E. Coordination for Other Tests. The Parties shall coordinate scheduling of any testing of the SSR Units that is required consistent with Good Utility Practice (*e.g.*, testing in

accordance with environmental and insurance requirements applicable to the Units), including the use of weekends and hours when the SSR Units are not expected to be used in order to complete the testing. During times for such testing, the SSR Units shall return to full service as dispatched by MISO (rescheduling the applicable testing) in the event of an emergency.

Section 8. Operation.

- A. Designated Unit Maintenance. Before the start of each contract year, Participant shall furnish MISO with its proposed schedule for Generator Planned Outages for inspection, repair, maintenance, and overhaul of the Designated Units for the contract year, in accordance with MISO's outage scheduling system. MISO shall approve or reject Generator Planned Outages in accordance with MISO's Business Practices Manual. MISO shall, if requested by Participant, endeavor to accommodate changes to the schedule to the extent that reliability of the MISO System is not materially affected by those changes. In all cases, MISO must find a time for Participant to perform maintenance in a reasonable timeframe as defined by Good Utility Practice.
- B. Planning Data. Participant shall timely report to MISO those items and conditions necessary for MISO's internal planning and compliance with MISO's guidelines in effect from time to time. The information supplied must include, without limitation, the following:
- (1) Availability Plan for the next day (in accordance with MISO Tariff deadlines).  
The information submitted in the Availability Plan will be consistent with the information submitted in the Resource Plan, and shall specify each Designated Unit's availability for the next day consistent with their Resource Adequacy

Requirements;

- (2) Revised Availability Plan reflecting changes in the Availability Plan in accordance with MISO Tariff deadlines; and
- (3) Status of each Designated Unit with respect to Environmental Limitations, if any. Participant shall timely report to MISO the status of the Designated Units with respect to Operational Limitations.

C. Delivery.

- (1) MISO shall notify Participant of the hours and levels, if any, that the Designated Units are to operate through day-ahead commitment and real-time dispatch for system reliability. The set point in the real-time dispatch shall be considered the “Delivery Plan” for the purposes of this Agreement. MISO shall not notify Participant to operate the SSR Units in a way that would violate the limitations on operation set out in Section 1 above. Notwithstanding the foregoing, Participant may offer its SSR Capability as described in Section 1.E into the MISO Energy & Operating Reserves Markets outside of the Delivery Plan when the SSR Units are not needed to address the reliability issues pertaining to this Agreement, consistent with Section 38.2.7(g) of the MISO Tariff. Such offers into MISO Markets shall be cost-based, including (but not limited to) Start-Up, No Load, and Energy Offers. Participant is encouraged to offer available Zonal Resource Credits into the Planning Resource Auction pursuant to the terms of the MISO Tariff.
- (2) Participant shall produce and deliver electrical energy and/or reactive power from

the SSR Units to the Delivery Point at the levels specified in the Delivery Plan.

- (3) MISO may dispatch the Designated Units only when necessary to ensure transmission system security, including any emergency situation. MISO may not dispatch the Designated Units if compliance with the dispatch would cause the Designated Units to exceed the Operational and Environmental Limitations, if any, set forth in Section 1 above or at levels greater than are shown in the Availability Plan. Notwithstanding the foregoing, Participant retains the responsibility for operating the Designated Units in accordance with limits provided by applicable law.
- (4) During the hours of operation of the SSR Units specified in the Delivery Plan, Participant may only participate in the MISO Energy and Operating Reserve Markets from the SSR Units in accordance with the relevant conditions in the MISO Tariff.

Section 9. Payment Provisions.

- A. For the transfer of any funds under this Agreement directly between MISO and Participant and pursuant to the Settlement procedures described in the MISO Tariff, the following shall apply:
  - (1) Participant appoints MISO to act as its agent with respect to such funds transferred and authorizes MISO to exercise such powers and perform such duties as described in this Agreement or the MISO Tariff, together with such powers or duties as are reasonably incidental thereto.



(2) MISO shall not have any duties, responsibilities to, or fiduciary relationship with Participant and no implied covenants, functions, responsibilities, duties, obligations or liabilities shall be read into this Agreement except as expressly set forth herein or in the MISO Tariff.

B. Compensation for the SSR Unit. MISO shall compensate Participant according to the terms of Exhibit 2 to this Agreement.

C. Settlement Provisions for the SSR Unit. At the conclusion of each calendar month, MISO shall conduct a settlement process for the SSR Units, consistent with the MISO Tariff requirements.

D. Performance-Related Payment Adjustments.

(1) For a SSR Unit, a “Misconduct Event” means any hour or hours during which Participant is requested to, but does not, deliver to MISO electrical energy and/or reactive power at a level of at least 98% on each hour (on a kilowatt-hour/hour or MVAR/hour basis) of the level shown in the Delivery Plan.

(2) Each day that a Misconduct Event continues after Participant receives written notice from MISO of the Misconduct Event is a separate Misconduct Event. A Misconduct Event is measured on a daily basis.

(3) Participant is excused from the Misconduct Event payment reduction arising from any Misconduct Event that is (a) not due to intentionally incomplete, inaccurate, or dishonest reporting to MISO by Participant of the availability of the Designated Unit, or (b) caused by a failure of the MISO Transmission System.

- (4) If a Misconduct Event is not excused, then to reflect this lower-than-expected quality of firmness, MISO's payments to Participant are reduced by the Unexcused Misconduct Amount not to exceed \$10,000 per day for all SSR units.
- (5) MISO shall inform Participant in writing of its determination if a Misconduct Event is unexcused.
- (6) MISO may offset any amounts due by Participant to MISO under this section against any amounts due by MISO to Participant under this Agreement.
- (7) Subject to the maximum amount set forth in clause (4) above, the Unexcused Misconduct Amount reduces payments to Participant (see Exhibit 2), and is composed of two parts:
  - (a) A fixed component equal to a proportionate reduction in the Monthly SSR Payment to Participant (see Exhibit 2) according to the reduction in Billing Capacity below the SSR Capacity, calculated for that portion of the month during which such reduction occurs. Billing Capacity is the lower of (i) the SSR Capacity and (ii) the Tested Capacity if lower than SSR Capacity for reasons not reported through the Outage Scheduler or if such reporting to MISO is intentionally incomplete, inaccurate, or dishonest.
  - (b) A variable component equal to the product of: (i) the difference between:
    - a) the level shown in the Delivery Plan and b) the amount of electrical energy and/or reactive power delivered to MISO; and (ii) an SSR Unit's Hourly Ex Post LMP in any hour or hours in which a Misconduct Event occurs.

E. Compensation for Unanticipated Repairs. During the Term of this Agreement, any

necessary repair or repairs to the SSR Units shall not entitle Participant to any additional compensation under this Agreement, except as provided herein. For the purposes of this Section, “unanticipated” repairs are those for which compensation is not provided for in the Annual SSR Amount contained in Exhibit 2 to this SSR Agreement. If the need arises to make an unanticipated repair to the SSR Units, Participant shall notify MISO before incurring said repair costs, together with reasonable information in support thereof. Upon such notification, MISO shall notify Participant either that: (i) it elects to exercise its rights to terminate this Agreement because the unanticipated repairs could not be accomplished in a manner that would preserve system reliability; or (ii) it agrees that Participant shall make such repairs, subject to the terms of parts 1 and 2 of this Section 9.E. In no circumstances shall the costs of repairs authorized by MISO pursuant to this Agreement be the responsibility of Participant. Participant shall not be deemed to have a Misconduct Event, nor shall Participant be subject to any other performance penalties under this Agreement or the MISO Tariff for the period of time after Participant notifies MISO of the need for repairs as provided in this Section 9.E and MISO provides to Participant written notification that it agrees to fund the costs of such repairs and directs Participant to make such repairs.

(1) Non-Emergency Repairs. Except as provided for in part 2 of this Section 9.E, before MISO may issue a notice to fund unanticipated repairs, MISO shall make and receive approval of a Federal Power Act (“FPA”) Section 205 filing at the Commission to modify this Agreement to provide for the recovery of such repair costs and shall serve such filing on all parties to whom such repair costs would be allocated. Participant shall not make such unanticipated repairs unless

and until MISO informs Participant in writing that it has received FERC approval to modify this Agreement to provide for the recovery of such costs.

(2) Emergency Repairs. If MISO reasonably believes that system security and reliability require any unanticipated repairs to be made before FERC can act on a Section 205 filing ("Emergency Repairs"), then MISO shall so notify Participant in writing and direct Participant to make such Emergency Repairs and MISO shall make a Section 205 filing at FERC as soon as reasonably practicable thereafter to modify this Agreement to provide for recovery of such repair costs. In the case of Emergency Repairs, if FERC later determines MISO's decision to approve such Emergency Repairs was imprudent or otherwise does not accept such modifications to the Agreement, then the costs of the Emergency Repairs shall be allocated pursuant to Section 38.2.7.k of the MISO Tariff (as filed in FERC Docket No. ER12-2302 on December 18, 2012).

F. Allocation of SSR Compensation. MISO will charge the LSEs that benefit from operation of the subject SSR Units in accordance with MISO Tariff Schedule 43F.

#### Section 10. Default.

A. Event of Default.

(1) Failure to make payment or transfer funds as provided in the MISO Tariff shall constitute a material breach and shall constitute an event of default ("Default") unless cured within three (3) Business Days after delivery by the non-breaching Party of written notice of the failure to the breaching Party. Provided further that if such a material breach, regardless of whether such breach is cured within the

allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth such breach shall constitute a Default by the breaching Party.

(2) For any material breach other than a failure to make payment or transfer funds, the occurrence and continuation of any of the following events shall constitute an event of Default by Participant:

(a) Except as excused under subsection (4) or (5) below, a material breach, other than a failure to make payment or transfer funds, of this Agreement by Participant, including any material failure by Participant to comply with the MISO Tariff, unless cured within fourteen (14) Business Days after delivery by MISO of written notice of the material breach to Participant. Participant must begin work or other efforts within three (3) Business Days to cure such material breach after delivery by MISO of written notice of such material breach by Participant and must prosecute such work or other efforts with reasonable diligence, consistent with Good Utility Practice, until the breach is cured. Provided further that if a material breach, regardless of whether such breach is cured within the allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth (4th) such breach shall constitute a Default.

(b) Participant becomes Bankrupt, except for the filing of a petition in involuntary bankruptcy, or similar involuntary proceedings that is dismissed within ninety (90) days thereafter.

- (c) The Designated Unit's operation is abandoned without intent to return it to operation during the Full Term; or
  - (d) Three or more unexcused Misconduct Events occur during a contract year.
- (3) Except as excused under subsection (4) or (5) below, a material breach of this Agreement by MISO, including any material failure by MISO to comply with the MISO Tariff, other than a failure to make payment or transfer funds, shall constitute a Default by MISO unless cured within fourteen (14) Business Days after delivery by Participant of written notice of the material breach to MISO. MISO must begin work or other efforts within three (3) Business Days to cure such material breach after delivery by Participant of written notice of such material breach by MISO and must prosecute such work or other efforts with reasonable diligence, consistent with Good Utility Practice, until the breach is cured. Provided further that if a material breach, regardless of whether such breach is cured within the allotted time after notice of the material breach, occurs more than three (3) times within a rolling twelve (12)-month period, the fourth such breach shall constitute a Default.
- (4) For any material breach other than a failure to make payment or transfer funds, the breach shall not result in a Default if the breach cannot reasonably be cured within fourteen (14) calendar days, prompt written notice is provided by the breaching Party to the other Party, and the breaching Party began work or other efforts to cure the breach within three (3) Business Days after delivery of the notice to the breaching Party and prosecutes the curative work or efforts with reasonable diligence, consistent with Good Utility Practice, until the curative

work or efforts are completed.

- (5) If, due to a Force Majeure Event, a Party is in breach with respect to any obligation hereunder, such breach shall not result in a Default by that Party.

B. Remedies for Default.

- (1) MISO's Remedies for Default. In the event of a Default by Participant, MISO may pursue any remedies MISO has under this Agreement, at law, or in equity, subject to the provisions of Section 12: Dispute Resolution of this Agreement. In the event of a Default by Participant, if the MISO Tariff does not specify a remedy for a particular Default, MISO may, at its option, upon written notice to Participant, immediately terminate this Agreement, with termination to be effective upon the date of delivery of notice.

- (2) Participant's Remedies for Default.

- (a) Unless otherwise specified in this Agreement or in the MISO Tariff, and subject to the provisions of Section 12: Dispute Resolution of this Agreement, in the event of a Default by MISO, Participant's remedies shall be limited to:

- (i) Immediate termination of this Agreement upon written notice to MISO,
- (ii) Monetary recovery in accordance with the Settlement procedures set forth in the MISO Tariff, and
- (iii) Specific performance.

- (b) However, in the event of a material breach by MISO of any of its

representations, warranties or covenants, Participant's sole remedy shall be immediate termination of this Agreement upon written notice to MISO.

- (c) If as a final result of any dispute resolution MISO, as the settlement agent, is determined to have over-collected from a Market Participant(s), with the result that refunds are owed by Participant to MISO, as the settlement agent such Market Participant(s) may request MISO to allow such Market Participant to proceed directly against Participant, in lieu of receiving full payment from MISO. In the event of such request, MISO, in its sole discretion, may agree to assign to such Market Participant MISO's rights to seek refunds from Participant, and Participant shall be deemed to have consented to such assignment. This subsection (c) shall survive termination of this Agreement.

- (3) A Default or breach of this Agreement by a Party shall not relieve either Party of the obligation to comply with the MISO Tariff.

C. Force Majeure.

- (1) If, due to a Force Majeure Event, either Party is in breach of this Agreement with respect to any obligation hereunder, such Party shall take reasonable steps, consistent with Good Utility Practice, to remedy such breach. If either Party is unable to fulfill any obligation by reason of a Force Majeure Event, it shall give notice and the full particulars of the obligations affected by such Force Majeure Event to the other Party in writing or by telephone (if followed by written notice) as soon as reasonably practicable, but not later than fourteen (14) calendar days,



after such Party becomes aware of the event. A failure to give timely notice of the Force Majeure event shall constitute a waiver of the claim of Force Majeure Event. The Party experiencing the Force Majeure Event shall also provide notice, as soon as reasonably practicable, when the Force Majeure Event ends.

- (2) Notwithstanding the foregoing, a Force Majeure Event does not relieve a Party affected by a Force Majeure Event of its obligation to make payments or of any consequences of non-performance pursuant to the MISO Tariff or under this Agreement, except that the excuse from Default provided by subsection 10.A(5) above is still effective.

- D. Duty to Mitigate. Except as expressly provided otherwise herein, each Party shall use commercially reasonable efforts to mitigate any damages it may incur as a result of the other Party's performance or non-performance of this Agreement.

Section 11. Limitation of Damages and Liability and Indemnification.

- A. EXCEPT AS EXPRESSLY LIMITED IN THIS AGREEMENT OR MISO BUSINESS PRACTICES, MISO OR PARTICIPANT MAY SEEK FROM THE OTHER, THROUGH APPLICABLE DISPUTE RESOLUTION PROCEDURES SET FORTH IN MISO PROTOCOLS, ANY MONETARY DAMAGES OR OTHER REMEDY OTHERWISE ALLOWABLE UNDER INDIANA LAW, AS DAMAGES FOR DEFAULT OR BREACH OF THE OBLIGATIONS UNDER THIS AGREEMENT; PROVIDED, HOWEVER, THAT NEITHER PARTY IS LIABLE TO THE OTHER FOR ANY SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES OR INJURY THAT MAY OCCUR, IN WHOLE OR IN PART, AS A RESULT OF A

DEFAULT UNDER THIS AGREEMENT, A TORT, OR ANY OTHER CAUSE, WHETHER OR NOT A PARTY HAD KNOWLEDGE OF THE CIRCUMSTANCES THAT RESULTED IN THE SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES OR INJURY, OR COULD HAVE FORESEEN THAT SUCH DAMAGES OR INJURY WOULD OCCUR.

- B. The Parties have expressly agreed that, other than subsections A and B of this Section, this Agreement shall not include any other limitations of liability or indemnification provisions, and that such issues shall be governed solely by applicable law, in a manner consistent with the Choice of Law and Venue subsection 13.A of this Agreement, regardless of any contrary provisions that may be included in or subsequently added to the MISO Tariff (outside of this Agreement).

Section 12. Dispute Resolution.

- A. In the event of a dispute, including a dispute regarding a Default, under this Agreement, Parties to this Agreement shall first attempt resolution of the dispute using the applicable dispute resolution procedures set forth in the MISO Tariff.
- B. In the event of a dispute, including a dispute regarding a Default, under this Agreement, each Party shall bear its own costs and fees, including, but not limited to attorneys' fees, court costs, and its share of any mediation or arbitration fees.

Section 13. Miscellaneous.

- A. Choice of Law and Venue. Notwithstanding anything to the contrary in this Agreement, this Agreement shall be deemed entered into in Indiana and, with the exception of matters governed exclusively by federal law, shall be governed by and construed and interpreted

in accordance with the laws of the State of Indiana that apply to contracts executed in and performed entirely within the State of Indiana, without reference to any rules of conflict of laws. Neither Party waives primary jurisdiction as a defense; provided that any court suits regarding this Agreement shall be brought in a state or federal court located within Indiana, and the Parties hereby waive any defense of *forum non-conveniens*.

B. Assignment.

- (1) Notwithstanding anything herein to the contrary, a Party shall not assign or otherwise transfer all or any of its rights or obligations under this Agreement without the prior written consent of the other Party, which shall not be unreasonably withheld or delayed, except that a Party may assign or transfer its rights and obligations under this Agreement without the prior written consent of the other Party (if neither the assigning Party or the assignee is then in Default of any Agreement with MISO):
  - (a) Where any such assignment or transfer is to an Affiliate of the Party; or
  - (b) Where any such assignment or transfer is to a successor to or transferee of the direct or indirect ownership or operation of all or part of the Party, or its facilities; or
  - (c) For collateral security purposes to aid in providing financing for itself, provided that the assigning Party will notify the other Party of any such assignment. Prior to or upon the exercise of the secured party's, trustee's or mortgagee's assignment rights pursuant to said arrangement entered into by either Party pursuant to this Section, the assigning Party, the secured creditor, the trustee or mortgagee will notify the other Party of the

date and particulars of any such exercise of assignment right(s). If requested by the Party making any such collateral assignment to a secured party, trustee or mortgagee (any such secured party, trustee, or mortgagee is hereinafter referred to as a "Financing Person"), the other Party shall execute and deliver a consent to such assignment containing customary provisions, including representations as to corporate authorization, enforceability of this Agreement and absence of known Defaults, notices of Default, and an opportunity for the Financing Person to cure Defaults.

(2) An assigning Party shall provide prompt written notice of the assignment to the other Party. Any attempted assignment that violates this Section is void and ineffective. Any assignment under this Agreement shall not relieve either Party of its obligations under this Agreement, nor shall either Party's obligations be enlarged, in whole or in part, by reason thereof.

C. No Third Party Beneficiary. Except with respect to the rights of other Market Participants in Section 10.B and the Financing Persons in Section 13.B, (1) nothing in this Agreement nor any action taken hereunder shall be construed to create any duty, liability or standard of care to any third party, (2) no third party shall have any rights or interest, direct or indirect, in this Agreement or the services to be provided hereunder and (3) this Agreement is intended solely for the benefit of the Parties, and the Parties expressly disclaim any intent to create any rights in any third party as a third-party beneficiary to this Agreement or the services to be provided hereunder. Nothing in this Agreement shall create a contractual relationship between one Party and the customers of the other Party, nor shall it create a duty of any kind to such customers.

- D. No Waiver. Parties shall not be required to give notice to enforce strict adherence to all provisions of this Agreement. No breach or provision of this Agreement shall be deemed waived, modified or excused by a Party unless such waiver, modification or excuse is in writing and signed by an authorized officer of such Party. The failure by or delay of either Party in enforcing or exercising any of its rights under this Agreement shall (1) not be deemed a waiver, modification or excuse of such right or of any breach of the same or different provision of this Agreement, and (2) not prevent a subsequent enforcement or exercise of such right. Each Party shall be entitled to enforce the other Party's covenants and promises contained herein, notwithstanding the existence of any claim or cause of action against the enforcing Party under this Agreement or otherwise.
- E. Headings. Titles and headings of paragraphs and sections within this Agreement are provided merely for convenience and shall not be used or relied upon in construing this Agreement or the Parties' intentions with respect thereto.
- F. Severability. In the event that any of the provisions, or portions or applications thereof, of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, that determination shall not affect the enforceability or validity of the remaining portions of this Agreement, and this Agreement shall continue in full force and effect as if it had been executed without the invalid provision; provided, however, if either Party determines, in its sole discretion, that there is a material change in this Agreement by reason thereof, the Parties shall promptly enter into negotiations to replace the unenforceable or invalid provision with a valid and enforceable provision. If the Parties are not able to reach an agreement as the result of such negotiations within fourteen (14) days, either Party shall have the right to terminate this Agreement on three

(3) days written notice.

- G. Entire Agreement. Any exhibits attached to this Agreement are incorporated into this Agreement by reference and made a part of this Agreement as if repeated verbatim in this Agreement. This Agreement represents the Parties' final and mutual understanding with respect to its subject matter. It replaces and supersedes any prior agreements or understandings, whether written or oral. No representations, inducements, promises, or agreements, oral or otherwise, have been relied upon or made by any Party, or anyone on behalf of a Party, that are not fully expressed in this Agreement. An agreement, statement, or promise not contained in this Agreement is not valid or binding.
- H. Amendment. The standard form of this Agreement may only be modified through the procedure for modifying the MISO Tariff described in the MISO Tariff. Any changes to the terms of the standard form of this Agreement shall not take effect until a new Agreement is executed between the Parties.
- I. MISO's Right to Audit Participant. Participant shall keep detailed records for a period of three years of all activities under this Agreement giving rise to any information, statement, charge, payment or computation delivered to MISO under the MISO Tariff. Such records shall be retained and shall be available for audit or examination by MISO as hereinafter provided. MISO has the right during Business Hours and upon reasonable written notice and reasonable cause to examine the records of Participant as necessary to verify the accuracy of any such information, statement, charge, payment or computation made under this Agreement. If any such examination reveals any inaccuracy in any information, statement, charge, payment or computation, the necessary adjustments in such information, statement, charge, payment, computation, or procedures used in

supporting its ongoing accuracy will be promptly made.

- J. Participant's Right to Audit MISO. Participant's right to data and audit of MISO shall be as described in the MISO Tariff and shall not exceed the rights described in the MISO Tariff.
- K. Further Assurances. Each Party agrees that during the term of this Agreement it will take such actions, provide such documents, do such things and provide such further assurances as may reasonably be requested by the other Party to permit performance of this Agreement.
- L. Conflicts. This Agreement is subject to applicable federal, state, and local laws, ordinances, rules, regulations, orders of any Governmental Authority and tariffs. Nothing in this Agreement may be construed as a waiver of any right to question or contest any federal, state and local law, ordinance, rule, regulation, order of any Governmental Authority, or tariff. In the event of a conflict between this Agreement and an applicable federal, state, and local law, ordinance, rule, regulation, order of any Governmental Authority or tariff, the applicable federal, state, and local law, ordinance, rule, regulation, order of any Governmental Authority or tariff shall prevail, provided that Participant shall give notice to MISO of any such conflict affecting Participant. In the event of a conflict between the MISO Tariff and this Agreement, the provisions expressly set forth in this Agreement shall control.
- M. No Partnership. This Agreement may not be interpreted or construed to create an association, joint venture, or partnership between the Parties or to impose any partnership obligation or liability upon either Party. Neither Party has any right, power, or authority to enter any agreement or undertaking for, or act on behalf of, or to act as or be an agent

or representative of, or to otherwise bind, the other Party except as provided in Section 9.A.

N. No State Public Utility Created. This Agreement may not be interpreted or construed as modifying the jurisdictional status of MISO, including, but not limited to establishment of MISO as a state public utility under the laws of any jurisdiction, as a result of MISO's performance under this Agreement.

O. Construction. In this Agreement, the following rules of construction apply, unless expressly provided otherwise or unless the context clearly requires otherwise:

- (1) The singular includes the plural, and the plural includes the singular.
- (2) The present tense includes the future tense, and the future tense includes the present tense.
- (3) Words importing any gender include the other gender.
- (4) The word "shall" denotes a duty.
- (5) The word "must" denotes a condition precedent or subsequent.
- (6) The word "may" denotes a privilege or discretionary power.
- (7) The phrase "may not" denotes a prohibition.
- (8) References to statutes, tariffs, regulations or the MISO Tariff include all provisions consolidating, amending, or replacing the statutes, tariffs, regulations or the MISO Tariff referred to.
- (9) References to "writing" include printing, typing, lithography, and other means of reproducing words in a tangible visible form.

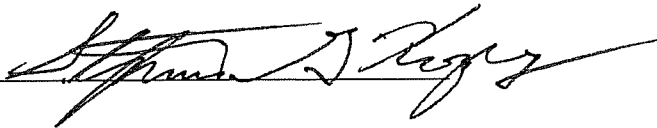


- (10) The words “including,” “includes,” and “include” are deemed to be followed by the words “without limitation.”
- (11) Any reference to a day, week, month or year is to a calendar day, week, month or year unless otherwise indicated.
- (12) References to Articles, Sections (or subdivisions of Sections), Exhibits, annexes or schedules are to this Agreement, unless expressly stated otherwise.
- (13) Unless expressly stated otherwise, references to agreements, the MISO Tariff and other contractual instruments include all subsequent amendments and other modifications to the instruments, but only to the extent the amendments and other modifications are not prohibited by this Agreement.
- (14) References to persons or entities include their respective successors and permitted assigns and, for governmental entities, entities succeeding to their respective functions and capacities.
- (15) References to time are to Eastern Standard Time.
- (16) References to any capitalized word or phrase not defined herein shall have the meanings from the MISO Tariff.

P. Multiple Counterparts. This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

SIGNED, ACCEPTED AND AGREED TO by each undersigned signatory who, by signature hereto, represents and warrants that he or she has full power and authority to execute this Agreement.

*Midcontinent Independent System Operator, Inc.:*

By: 

Name: Stephen Kozey

Title: Sr. Vice President and General Counsel

Date: November 1, 2013

*Participant:*

By: /s/ Robert W. Berry

Name: Robert W. Berry

Title: Chief Operating Officer

Date: November 1, 2013

EXHIBIT 1

Detailed Description of SSR Units

Coleman Generating Station

Unit Nos. 1-3

4982 River Road

Hawesville, KY 42348

UNIT DESCRIPTION

Initial service date – Unit 1 (1969); Unit 2 (1970); Unit 3 (1971)

Coal Fired Steam Boiler

Bituminous Coal Fueled

## EXHIBIT 2

### Description of SSR Unit Going-Forward Compensation

#### A. Fixed Component of Compensation

Pursuant to Section 9 of the Agreement, MISO shall pay Participant a Monthly SSR Payment of \$3,414,502 for Units 1-3, representing monthly allocations of budgeted fixed costs from an Annual SSR Amount for all Units to each month during the term of the SSR Agreement. If (i) this Agreement is terminated with respect to Unit 1 and (ii) Units 2 and 3 remain SSR Units, MISO shall pay Participant a Monthly SSR Payment of \$2,250,936, representing monthly allocations of budgeted fixed costs from an Annual SSR Amount for Units 2-3 to each month during the term of the SSR Agreement. Each such Monthly SSR Payment shall be made regardless of dispatch of the SSR Unit during that month. If this SSR Agreement is terminated for any Unit, effective during the course of a calendar month, then the corresponding Monthly SSR Payment shall be prorated for that month.

The MISO payment to Participant is subject to true up for the SSR Units based upon the actual costs incurred by Participant in operating the SSR Units, which shall be settled within 55 days after the last day of the month for each month of the Agreement. For the completion of the true up calculations, Participant shall submit the actual costs to MISO such that the information is received by MISO within 50 days after the last day of the month for each month of the Agreement. Such submissions to MISO shall be sent to MISO at the address stated in Section 3.D of this Agreement, to the attention of the Manager of Market Settlements. Both Parties acknowledge that actual costs under this Agreement may be larger or smaller than the agreed upon (budgeted) Monthly SSR Amount for each Unit. Actual plant O&M and maintenance capital costs sustained in accordance with Good Utility Practice and any unit operational requirements dictated under the

terms of this agreement will form the basis for the trued up amount paid or charged to Participant by MISO.

The compensation provided for under this Agreement may be further modified pursuant to Section 7 (adjustment to Monthly SSR Payment based on Capacity Tests) and/or Section 9.D (“Performance-Related Payment Adjustments) and/or Section 9.E (“Compensation for Unanticipated Repairs”) of the Agreement. Compensation shall be settled on a monthly basis.

**B. Variable Component of Compensation**

Pursuant to Section 9 of the Agreement, MISO shall pay Participant its Production Cost for the amount of Actual Energy Injections (as defined in Module A Section 1.1a of the MISO Tariff) and Operating Reserve Cost in each instance that MISO dispatches the SSR Unit. For purposes of this Agreement, “Production Cost” shall mean the Energy output cost of the SSR Unit based upon Start Up, No Load, and Energy Offer cost components that reflect the actual costs of physically operating the SSR Unit, and “Operating Reserve Cost” shall mean the actual cost to provide Operating Reserves. All Production Costs and Operating Reserve Costs will be subject to audit by MISO, and will be subject to audit and enforcement by the Independent Market Monitor (“IMM”) (such audit and enforcement provision shall not be interpreted as a limitation on MISO and IMM activities or responsibilities).

Through the MISO settlement process, MISO will ensure that Participant is paid the “SSR Unit Compensation,” which is equal to the sum of Production Cost and Operating Reserve Cost over all the SCUC Instructed Hours of Operation in the Day for that SSR Unit. MISO will compare the SSR Unit Compensation to the “SSR Unit Energy and Operating Reserve Credit.” The SSR Unit Energy and Operating Reserve Credit are those charges and credits calculated pursuant to Sections 39.3 Day-Ahead Energy and Operating Reserve Market and 40.3 Real Time

Energy and Operating Reserve Market Settlement of the MISO Tariff, plus any revenues from Schedule 2 associated with the SSR Unit or from Planning Resource designation and any charges assessed through Schedule 17 and Schedule 24. In those hours where the SSR Unit Compensation is greater than the SSR Unit Energy and Operating Reserve Credit, MISO will make the applicable make-whole payment to Participant (such make-whole payment to be equal to the difference between the SSR Unit Compensation and the SSR Unit Energy and Operating Reserve Credit). In those hours where the SSR Unit Compensation is less than the SSR Unit Energy and Operating Reserve Credit, MISO will debit from Participant (such debit to be equal to the difference between the SSR Unit Energy and Operating Reserve Credit and the SSR Unit Compensation).

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**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**Midcontinent Independent  
System Operator, Inc.**

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**Docket No. ER14-\_\_\_\_\_**

**DIRECT TESTIMONY  
OF  
ROBERT W. BERRY**

**October 30, 2013**



1 **Q. Please state your name and business address.**

2 A. My name is Robert W. Berry. My business address is 201 Third Street, Henderson,  
3 Kentucky 42420. I am employed by Big Rivers Electric Corporation, a Kentucky electric  
4 generation and transmission cooperative (“Big Rivers”).

5 **Q. What is your current position with Big Rivers?**

6 A. I am the Chief Operating Officer.

7 **Q. What are your duties and responsibilities in your current role as Chief Operating**  
8 **Officer?**

9 A. In this role, I am responsible for the operations and maintenance activities at Big Rivers’  
10 four generating stations, including the Kenneth C. Coleman Generating Station in  
11 Hawesville, Kentucky (“Coleman Station”). I am also responsible for Energy Services,  
12 Energy Control and Transmission System activities.

13 **Q. What is the purpose of your testimony?**

14 A. I am presenting this testimony in support of the System Support Resource (“SSR”)  
15 Agreement between Big Rivers and the Midcontinent Independent System Operator  
16 (“MISO”) relating to the continued operation of the Coleman Station generating units.

17 **Q. Please describe the Coleman Station plant.**

18 A. Coleman Station is a coal-fired steam electric generation facility located near Hawesville,  
19 Kentucky. It consists of three generating units with a combined net megawatt (“MW”)  
20 capacity of 443 MW. The net capacity of the individual units is as follows: 150 MW for  
21 Unit 1, 138 MW for Unit 2, and 155 MW for Unit 3.

1 **Q. Were you involved in the preparation of Big Rivers' Attachment Y notification?**

2 A. Yes. On May 24, 2013, Big Rivers submitted a completed Attachment Y notice to MISO  
3 requesting permission to suspend from service the Coleman Station units effective  
4 September 1, 2013.

5 **Q. Why did Big Rivers submit an Attachment Y for the Coleman Station units?**

6 A. As of August 20, 2013, a large industrial customer of one of Big Rivers' member  
7 distribution cooperatives, Kenergy Corp., is no longer being served from Big Rivers'  
8 generating resources. Due to the loss of this large industrial customer, Big Rivers  
9 determined that it was no longer economic to continue operating the Coleman Station  
10 units until such time the wholesale market prices improve or until it can sell the capacity  
11 and energy previously utilized by the large industrial customer. Under the MISO Tariff,  
12 a Market Participant that plans to retire or suspend all or a portion of a generation  
13 resource must notify MISO by submitting a completed Attachment Y. If MISO  
14 determines that continued operation of the generation resource is required to maintain the  
15 reliability of the MISO-operated transmission system, MISO will designate the resource a  
16 SSR and tender a draft SSR Agreement to ensure continued operation of and appropriate  
17 compensation for the SSR units.

18 **Q. What was MISO's response to Big Rivers' Attachment Y notification?**

19 A. In response to Attachment Y notification, MISO informed Big Rivers that Big Rivers  
20 must maintain availability of the Coleman Station units. MISO tendered a draft of the  
21 SSR Agreement to Big Rivers on August 12, 2013. Subsequently, MISO completed a  
22 reliability assessment confirming that the continued operation of the Coleman Station  
23 units was necessary to avoid violations of applicable reliability standards.

1 **Q. Has Big Rivers maintained the availability of the Coleman Station units since**  
2 **receiving notice from MISO?**

3 A. Yes. Big Rivers has complied with MISO's request and continued to operate the plant  
4 beyond the date specified in Big Rivers' Attachment Y notice.

5 **Q. Absent the request from MISO to maintain the availability of the Coleman Station**  
6 **units, would Big Rivers have maintained the availability of those units?**

7 A. No. Big Rivers, having satisfied its Attachment Y notice requirements, would have  
8 begun to suspend the operation of the Coleman Station units to limit continued  
9 operational losses.

10 **Q. Has Big Rivers incurred costs and or losses during the time since MISO requested**  
11 **that the Coleman Station units remain available?**

12 A. Yes. The Coleman Station units continue to lose money because the costs to operate and  
13 maintain the units exceed wholesale market revenues.

14 **Q. Has Big Rivers received any SSR compensation for the continued availability of the**  
15 **Coleman Station units?**

16 A. No.

17 **Q. Were you involved in developing the proposed SSR Agreement and the costs**  
18 **recovery provided therein?**

19 A. Yes.

20 **Q. Please describe that process.**

21 A. Since being notified that the Coleman Station units would be needed for reliability, Big  
22 Rivers engaged with MISO in a series of discussions regarding compensation necessary  
23 for the continued availability of the Coleman Station units. Big Rivers provided cost data

1 to MISO, and worked closely with MISO to determine the appropriate level of  
2 compensation for maintaining the availability of the Coleman Station units for reliability.

3 **Q. Was the MISO Independent Market Monitor (“IMM”) also involved in those**  
4 **discussions?**

5 A. Yes. Representatives of the IMM were involved in these discussions, and reviewed the  
6 cost data.

7 **Q. Did Big Rivers make any adjustments in response to the IMM’s comments?**

8 A. Yes. In response to comments from the IMM, Big Rivers re-allocated its capital costs to  
9 fixed costs, and limited some other costs, including property taxes, insurance, plant labor,  
10 and operations and maintenance. I sometimes refer in my testimony to these other costs  
11 as “O&M”. Big Rivers limited O&M to the difference between what O&M would be if  
12 the Coleman Station units were suspended from operation versus what O&M would be if  
13 Big Rivers were required to maintain the units’ availability for reliability.

14 **Q. Did Big Rivers and MISO agree on the compensation that should be provided under**  
15 **the SSR Agreement?**

16 Yes.

17 **Q. Please describe the compensation provided under the SSR Agreement.**

18 A. The SSR Agreement provides for recovery of going-forward fixed and variable costs to  
19 maintain the availability of the Coleman Station units for reliability. The fixed cost  
20 component is based on an annual revenue requirement to cover some fixed costs related  
21 to maintaining the availability of the Coleman Station units. This revenue requirement is  
22 referred to in the SSR Agreement as the “Annual SSR Amount.” Subject to the terms of  
23 the SSR Agreement, MISO will pay the revenue requirement for all three Coleman

1 Station units through monthly payments of \$3,414,502, representing monthly allocations  
2 of the Annual SSR Amount. If the SSR Agreement is terminated with respect to Unit 1,  
3 the monthly SSR payments for the remainder of the term of the SSR Agreement will be  
4 reduced to \$2,250,936. The SSR Agreement separately provides for variable generation  
5 costs reimbursement when the units are dispatched for reliability.

6 **Q. Please explain the cost components of the Annual SSR Amount.**

7 A. The Annual SSR Amount is based on the 2013 budgets for the Coleman Stations units,  
8 and includes the following cost components:

9 (1) Fixed Costs: For the one-year SSR Agreement term, fixed costs for operating  
10 all three of the Coleman Station units are estimated to be \$32,057,717, or  
11 \$24,408,837 if the SSR Agreement is terminated with respect to Unit 1. Included  
12 in this estimate is the cost of non-labor O&M costs, plant labor, general and  
13 administrative costs, and property taxes and insurance.

14 (2) Capital: Capital costs during the one-year SSR Agreement term for operating  
15 all three of the Coleman Station units are estimated to be \$8,200,658, or  
16 \$1,886,754 if the SSR Agreement is terminated with respect to Unit 1. A detailed  
17 list of the capital items included in this estimate was provided with the SSR  
18 budget. The replacement of these items is necessary to maintain the operation of  
19 the Coleman Station units during the term of the SSR Agreement.

20 (3) Return on Net Rate Base: The Annual SSR Amount includes a 7.85% return  
21 on net rate base (carrying costs for fuel inventory, reagent, and materials and  
22 supplies), calculated as a percentage of the total inventory and capital required to  
23 operate the units during the term of the SSR Agreement. The return on net rate

1 base for the operation of (1) all three units, or (2) Unit 2 and Unit 3 is estimated to  
2 be \$715,643

3 **Q. Does the SSR compensation account for other sources of revenue Big Rivers may**  
4 **receive for the Coleman Station units during the term of the SSR Agreement?**

5 A. Yes. As described in the SSR Agreement, any supplemental revenue received through  
6 the MISO markets beyond the SSR compensation will be debited or credited against the  
7 SSR compensation in the settlements process to prevent double-recovery by Big Rivers.  
8 These additional revenue streams include Schedule 2 payments for reactive power and  
9 capacity revenues, if any, attributable to the Coleman Station units.

10 **Q. Please explain the variable generation payment to be paid by MISO when the units**  
11 **are dispatched for reliability.**

12 A. Because the Annual SSR Amount covers certain fixed costs that do not include the  
13 marginal cost of generating, the SSR Agreement also provides for a separate payment  
14 when the unit is dispatched. The SSR Agreement does not establish a fixed price for  
15 these payments, but will instead provide for reimbursement of the actual costs of each  
16 dispatch. Specifically, under the terms of the SSR Agreement, Big Rivers will offer the  
17 Coleman Station units in each available hour at its marginal cost of generating.  
18 Accordingly, every time MISO dispatches the Coleman Station units for reliability,  
19 MISO will provide Big Rivers with the costs of its three-part offer, consisting of start-up  
20 costs, no-load costs, and incremental energy costs. The incremental energy component  
21 will be based on average fuel cost.

22 **Q. How will Energy and Ancillary Services revenues be accounted for when the units**  
23 **are dispatched for reliability?**

1 A. Because the MISO settlement process is based on market-clearing prices, MISO will  
2 implement an additional step in the settlement process for the Coleman Station units.  
3 This step is intended to make Big Rivers whole when market-clearing prices are lower  
4 than its three-part offer for the Coleman Station units, and to debit Big Rivers' account  
5 with MISO when market-clearing prices exceed the three-part offer. This process  
6 ensures that Big Rivers does not stand to recover more than its cost-based offer from  
7 MISO's reliability-related dispatches, while receiving SSR compensation.

8 **Q. Is there any other provision of the SSR Agreement that ensures that SSR**  
9 **compensation will not exceed actual costs of operating the Coleman Station units for**  
10 **reliability?**

11 A. Yes. Exhibit 2 includes a provision to "true-up" actual fixed costs with compensation  
12 under the SSR Agreement for budgeted fixed costs. That exhibit provides that the  
13 Monthly SSR Payment to Big Rivers will be subject to true-up upon termination of the  
14 SSR Agreement for any Unit, based on actual costs incurred by Big Rivers in operating  
15 the Coleman Station units. The amount paid or charged to Big Rivers by MISO will  
16 reflect actual plant O&M and maintenance capital costs incurred in accordance with  
17 Good Utility Practice and any unit's operational requirements under the SSR Agreement.

18 **Q. Does the SSR Agreement address any environmental limitations of the Coleman**  
19 **Station units?**

20 A. Yes. The SSR Agreement specifies certain limitations on the output of the Coleman  
21 Station units for SO<sub>2</sub> and NO<sub>x</sub>. Under the pro forma SSR Agreement, MISO cannot  
22 dispatch a unit if the dispatch would cause it to violate applicable environmental

1 restrictions. The same would be true for the Coleman Station units under the SSR  
2 Agreement.

3 **Q. Does this conclude your testimony?**

4 A. Yes.

5 **[Next page is signature page]**



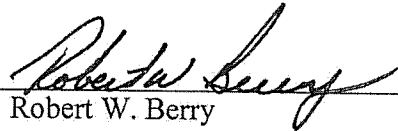
UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION

Midcontinent Independent  
System Operator, Inc.

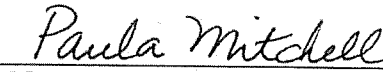
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Docket No. ER14-\_\_\_\_

I, Robert W. Berry, Chief Operating Officer for Big Rivers Electric Corporation, verify, state and affirm that the foregoing testimony is true and correct to the best of my knowledge and belief.

  
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Robert W. Berry  
Chief Operating Officer  
Big Rivers Electric Corporation

SUBSCRIBED AND SWORN to before me by Robert W. Berry, Chief Operating Officer of Big Rivers Electric Corporation, on this the 30<sup>th</sup> day of October, 2013.

  
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Notary Public