SCHEDULE 3

REGULATING RESERVE

I. GENERAL

Regulating Reserve is necessary to i) continuously balance the total output of all Resources within the MISO Balancing Authority Area with the total demand of all loads (including losses) within the MISO Balancing Authority Area plus the Net Scheduled Interchange of the MISO Balancing Authority Area and ii) assist in maintaining the difference between scheduled Interconnection frequency and actual Interconnection frequency within acceptable limits based on Applicable Reliability Standards. Regulation Deployment is accomplished by using automatic control equipment to raise or lower the output of on-line Resources as necessary to follow the moment-by-moment changes in demand and frequency. The obligation to maintain this balance between supply and demand lies with the MISO Balancing Authority. The MISO Balancing Authority will procure this service on behalf of the Load Serving Entities from cleared Resource Offers submitted by Market Participants selected in the Energy and Operating Reserve Markets, as provided for in Sections 39.2 and 40.2 of this Tariff. A Load Serving Entity must purchase this service from the MISO Balancing Authority to satisfy its Regulating Reserve Obligation, where such Obligation is defined below. The MISO Balancing Authority will consider the speed and accuracy of Resources providing Regulating Reserve when determining required Regulating Reserve levels.

II. DESCRIPTION OF SERVICE

Regulating Reserve is unloaded and loaded Resource capacity utilized by the MISO Balancing Authority to manage the area control error as necessary to comply with Applicable

Reliability Standards. Regulating Reserve is cleared and priced every Hour in the Day-Ahead Energy and Operating Reserve Market and every Dispatch Interval in the Real-Time Energy and Operating Reserve Market. Regulating Reserve is settled on an Hourly basis in the Day-Ahead Energy and Operating Reserve Market, and every Dispatch Interval in the Real-Time Energy and Operating Reserve Market. Regulating Reserve can only be supplied by Regulation Qualified Resources.

III. PURCHASE OBLIGATIONS WITHIN THE MISO BALANCING AUTHORITY AREA AND RATES

Day-Ahead and Real-Time Regulating Reserve procurement costs are collected from Load Serving Entities on a zonal basis using the following rate methodology:

A. Binding Settlement Zone Regulating Reserve Charges

Market Participants, and Carved-Out GFA billing entities associated with Carved-Out GFAs, with Actual Energy Withdrawals within a Binding Settlement Zone shall be charged each Hour, a pro-rata share of the total payments to Market Participants ("MP") for Resources providing Regulating Reserve within that Binding Settlement Zone for that Hour as follows:
Costs allocated to Carved-Out GFAs:

Carved-Out GFA Regulating Reserve Charge = GFA Regulating Reserve Procurement and Mileage Rate multiplied by MP Carved-Out GFA Actual Energy Withdrawal minus the applicable Day Ahead Ex Post MCP for Regulating Reserve or Hourly Real-Time Ex Post MCP for Regulating Reserve multiplied

by the Minimum of [Regulating Reserve schedules associated with the Carved-Out GFA, and the MP Carved-Out GFA Regulating Reserve Obligation] for the Binding Settlement Zone,

Where:

GFA Regulating Reserve Procurement and Mileage Rate = Regulating Reserve Procurement and Mileage Cost / Total Actual Energy Withdrawal in the Non-Binding Settlement Zone;

Regulating Reserve Procurement and Mileage Cost = The sum of all credits calculated under Section 39.3.2A.a plus the sum of all charges/credits calculated under Section 40.3.3.3.b.ii specific to Resources providing Regulating Reserve within the Binding Settlement Zone;

MP Carved-Out GFA Actual Energy Withdrawal = Market Participant Actual Energy Withdrawal, associated with Carved-Out GFA Actual Energy Withdrawal and excluding real-time Export Schedules, within the Binding Settlement Zone;

Total Actual Energy Withdrawal = The sum of all Market Participant Actual Energy Withdrawals, including Carved-Out GFA Actual Energy Withdrawals and excluding real-time Export Schedules, within the Binding Settlement Zone; and

MP Carved-Out GFA Regulating Reserve Obligation = MP Carved-Out GFA Actual Energy Withdrawal divided by Total Actual Energy Withdrawal within the Binding Settlement Zone multiplied by the sum of all Regulating Reserve schedules within the Binding Settlement Zone.

Costs allocated to Non-GFA Withdrawals:

Regulating Reserve Charge non-GFA = Non-GFA Regulating Reserve Procurement and Mileage Rate * MP Actual Energy Withdrawal for the Non-Binding Settlement Zone,

Where:

Non-GFA Regulating Reserve Procurement and Mileage Rate = The difference between the Non-GFA Regulating Reserve Procurement and Mileage Cost and the aggregate sum of all Carved-Out GFA Regulating Reserve Charges divided by

Total Actual Non-GFA Energy Withdrawals within the Binding Settlement Zone;

Non-GFA Regulating Reserve Procurement and Mileage Cost = The sum of all credits calculated under Section 39.3.2A.a plus the sum of all charges/credits calculated under Section 40.3.3.3.b.ii specific to Resources providing Regulating Reserve minus the aggregate sum of the applicable Day Ahead Ex Post MCP for Regulating Reserve or Hourly Real-Time Ex Post MCP for Regulating Reserve multiplied by the Minimum of [Regulating Reserve schedules associated with the Carved-Out GFA, and the MP Carved-Out GFA Regulating Reserve Obligation] for all GFA billing entities within the Binding Settlement Zone;

MP Actual Energy Withdrawal = Market Participant Actual Energy Withdrawal, excluding Carved-Out GFA Actual Energy Withdrawal and excluding real-time Export Schedules, within the Binding Settlement Zone; and

Total Actual Non-GFA Energy Withdrawals = The sum of all Market Participant Actual Energy Withdrawals, excluding Carved-Out GFA Actual Energy Withdrawals and excluding real-time Export Schedules, within the Binding Settlement Zone.

B. Non-Binding Settlement Zone Regulating Reserve Charge

Market Participants, other than Carved-Out GFA billing entities associated with Carved-Out GFAs, with Actual Energy Withdrawals within a Non-Binding Settlement Zone shall be charged each Hour, a pro-rata share of the total payments to Market Participants for Resources providing Regulating Reserve within that Non-Binding Settlement Zone for that Hour as follows:
Costs allocated to Carved-Out GFAs:

Carved-Out GFA Regulating Reserve Charge = GFA Regulating Reserve Procurement and Mileage Rate multiplied by the MP Carved-Out GFA Actual Energy Withdrawal minus the applicable Day Ahead Ex Post MCP for Regulating Reserve or Hourly Real-Time Ex Post MCP for Regulating Reserve multiplied by the Minimum of [Regulating Reserve schedules associated with the Carved-Out GFA, and the MP Carved-Out GFA

Regulating Reserve Obligation] for the Non-Binding Settlement Zone,

Where:

GFA Regulating Reserve Procurement Rate = Regulating Reserve Procurement and Mileage Cost / Total Actual Energy Withdraw in the Non-Binding Settlement Zone;

Regulating Reserve Procurement and Mileage Cost = The sum of all credits calculated under Section 39.3.2A.a plus the sum of all charges/credits calculated under Section 40.3.3.3.b.ii specific to Resources providing Regulating Reserve within the Non-Binding Settlement Zone;

MP Carved-Out GFA Actual Energy Withdrawal = Market Participant Actual Energy Withdrawal, associated with Carved-Out GFA Actual Energy Withdrawal and excluding real-time Export Schedules, within the Non-Binding Settlement Zone;

Total Actual Energy Withdrawal = The sum of all Market Participant Actual Energy Withdrawals, including Carved-Out GFA Actual Energy Withdrawals and excluding real-time Export Schedules,

within the Non-Binding Settlement Zone; and

MP Carved-Out GFA Regulating Reserve Obligation = MP Carved-Out GFA Actual Energy Withdrawal divided by Total Actual Energy Withdrawal within the Binding Settlement Zone multiplied by the sum of all Regulating Reserve schedules within the Non-Binding Settlement Zone.

Costs allocated to Non-GFA Withdrawals:

Regulating Reserve Charge non-GFA = Non-GFA Regulating Reserve Procurement and Mileage Rate * MP Actual Energy Withdrawal for the Non-Binding Settlement Zone,

Where:

Non-GFA Regulating Reserve Procurement and Mileage Rate = the difference between the Non-GFA Regulating Reserve Procurement and Mileage Cost and the aggregate sum of all Carved-Out GFA Regulating Reserve Charges divided by Total Actual Non-GFA Energy Withdrawals within the Non-Binding Settlement Zone;

Non-GFA Regulating Reserve Procurement and Mileage Cost = The sum of all credits calculated under Section 39.3.2A.a plus the sum of all charges/credits calculated under Section 40.3.3.3.b.ii specific to Resources providing Regulating Reserve minus the aggregate sum of the applicable Day Ahead Ex Post MCP for Regulating Reserve or Hourly Real-Time Ex Post MCP for Regulating Reserve multiplied by the Minimum of [Regulating Reserve schedules associated with the Carved-Out GFA, and the MP Carved-Out GFA Regulating Reserve Obligation] for all GFA billing entities within the Non-Binding Settlement Zone;

MP Actual Energy Withdrawal = Market Participant Actual Energy Withdrawal, excluding Carved-Out GFA Actual Energy Withdrawal and excluding real-time Export Schedules, within the Non-Binding Settlement Zone; and

Total Actual Non-GFA Energy Withdrawals = The sum of all Market Participant Actual Energy Withdrawals, excluding Carved-Out

GFA Actual Energy Withdrawals and excluding real-time Export Schedules, within the Non-Binding Settlement Zone;

IV. PROVISIONS TO SATISFY REGULATING RESERVE OBLIGATIONS VIA SELF-SCHEDULES

A Market Participant may Self-Schedule from their Regulation Qualified Resources in the Energy and Operating Reserve Markets to meet their hourly Market-Wide Regulating Reserve Obligation. A Market Participant's hourly Market-Wide Regulating Reserve Obligation shall be equal to the Market-Wide Regulating Reserve Requirement multiplied by the ratio of the Market Participant's Actual Energy Withdrawals, excluding real-time Export Schedules, to MISO Balancing Authority Load, excluding real-time Export Schedules. Such Self-Scheduled Regulating Reserve shall be compensated at the applicable Regulating Reserve Market Clearing Price for that Resource pursuant to Sections 39 and 40 of this Tariff.

V. UNDEPLOYED REGULATING MILEAGE REVENUE SUFFICIENCY GUARANTEE CREDIT

The Regulation Reserve Credit specified in Section 40.3.3.3.b.ii includes the Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit. The Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit consists of a Day-Ahead and a Real-Time component calculated as follows:

Step 1: For each Dispatch Interval with non-zero Undeployed Regulating Mileage, the Undeployed Regulating Mileage is split into the amount attributed to Day-Ahead and the amount attributed to Real-Time, calculated as follows:

$UndeployedRegMileage\_DA\_NoSS_t$=

$max\ [0, UndeployedRegMileage_t - RegMilDeplRatio * max(ClrReg_t^{RT} - ClrReg_h^{DA}, 0)]$

$UndeployedRegMileage\_DA_t$=

$Min\{\ RegMilDeplRatio * max(0, ClrReg_h^{DA} - SSReg_h^{DA}),$

$UndeployedRegMileage\_DA\_NoSS_t\ \}$

$UndeployedRegMileage\_RT_t$ =

$Min\{\ RegMilDeplRatio * max(0, ClrReg_t^{RT} - SSReg_t^{RT}),$

$UndeployedRegMileage_t - UndeployedRegMileage\_DA\_NoSS_t\}$

Where

RegMilDeplRatio = Market-wide Regulating Mileage Deployment Ratio

$ClrReg_h^{DA}$ = Day-Ahead Schedule for Regulating Reserve for hour *h*.

$SSReg_h^{DA}$ = Day-Ahead Self Schedule for Regulating Reserve for Hour h.

$ClrReg_t^{RT}$ = Real-Time Dispatch Target for Regulating Reserve for Interval t.

$SSReg_h^{RT}$ = Real-Time Self Schedule for Regulating Reserve for Hour h.

$UndeployedRegMileage_t$ = Undeployed Regulating Mileage for Dispatch Interval *t*.

$UndeployedRegMileage\_DA\_NoSS_t$ = Undeployed Regulating Mileage attributed to Day-Ahead for Dispatch Interval t under no Day-Ahead Self Schedule for Regulating Reserve at the Hour.

$UndeployedRegMileage\_DA_t$ = Undeployed Regulating Mileage attributed to Day-Ahead for Dispatch Interval t.

$UndeployedRegMileage\_RT_t$ = Undeployed Regulating Mileage attributed to Real-Time for Dispatch Interval t.

Step 2: If the Undeployed Regulating Mileage attributed to Day-Ahead is zero in Dispatch Interval *t*, the Day-Ahead component of the Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit for that Dispatch Interval t is zero. For Resources with non-zero Undeployed Regulating Mileage attributed to Day-Ahead in any Dispatch Interval *t* in an Hour *h*, the Day-Ahead component of the Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit is calculated as:

$$(\text{Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit})_h^{DA} =$$

$$\text{Max}\{0, (\textit{DA Profit Loss from Undeployed Regulating Mileage})_h^{DA} - (\textit{DA Net Positive Energy and Operating Reserve Margin})_h^{DA}\}$$

The Day-Ahead profit loss from Undeployed Regulating Mileage in Hour h is calculated as:

$$(\textit{DA Profit Loss from Undeployed Regulating Mileage})_h^{DA} = \text{Max}\{0, \sum_{t \text{ in } h}[(\textit{RegMileageMCP}_t^{RT} - \textit{RegMileageOffer}_h^{DA}) * \textit{UndeployedRegMileage\_DA}_t]\}$$

Where:

$RegMileageMCP_t^{RT}$ = the Ex Post MCP for Regulating Mileage for Dispatch Interval *t*.

$RegMileageOffer_h^{DA}$ = Day-Ahead Regulating Mileage Offer for Hour *h*.

$UndeployedRegMileage\_DA_t$ = Undeployed Regulating Mileage attributed to Day-Ahead for Dispatch Interval t.

The Day-Ahead net positive Energy and Operating Reserve margin is equal to:

$$(\textit{DA Net Positive Energy and Operating Reserve Margin})_h^{DA} =$$

Max{0, (revenue received in the Day-Ahead Energy and Operating Reserve Market for Day-Ahead Schedules for Energy in Hour h) + (revenue received in the Day-Ahead Energy and Operating Reserve Market for Day-Ahead Schedules for Operating Reserves in Hour h) - (Energy Offer cost for the Day-Ahead Schedule for Energy in Hour h) – (Operating Reserve Offer cost for Day-Ahead Schedules for Operating Reserves above the Self Schedule for the applicable Operating Reserves in Hour h) – (No Load Offer cost and prorated Start Up Offer cost in Hour h for Resources eligible for Day-Ahead Revenue Sufficiency Guarantee Credit)}

Step 3: If the Undeployed Regulating Mileage attributed to Real-Time is zero in Dispatch Interval *t*, the Real-Time component of the Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit for that Dispatch Interval is zero. For Resources with non-zero Undeployed Regulating Mileage attributed to Real-Time in any Dispatch Interval *t* in an Hour *h*, the Real-Time component of the Undeployed Regulating Mileage Revenue Sufficient Guarantee credit is calculated as:

$$(\text{Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit})_h^{RT} =$$

$$\text{Max}\{0, (\textit{RT Profit Loss from Undeployed Regulating Mileage})_h^{RT} - (\textit{RT Net Positive Energy and Operating Reserve Margin})_h^{RT}\}$$

The Real-Time profit loss from Undeployed Regulating Mileage in Hour h is calculated as:

$$(\textit{RT Profit Loss from Undeployed Regulating Mileage})_h^{RT} =$$

$$\text{Max}\{0, \sum_{t \text{ in } h} [(\textit{RegMileageMCP}_t^{RT} - \textit{RegMileageOffer}_h^{RT}) * \textit{UndeployedRegMileage\_RT}_t\}$$

Where

$\textit{RegMileageMCP}_t^{RT}$ = Ex Post MCP for Regulating Mileage for Dispatch Interval *t*.

$RegMileageOffer_h^{RT}$ = Real-Time Regulating Mileage Offer for Hour *h*.

$UndeployedRegMileage\_RT_t$ = Undeployed Regulating Mileage attributed to Real-Time for Dispatch Interval t.

The Real-Time positive Energy and Operating Reserve margin in Hour h is calculated as:

$(RT\ Net\ Positive\ Energy\ and\ Operating\ Reserve\ Margin)_h^{RT}$ =

Max{0, (revenue or charges in the Real-Time Energy and Operating Reserve Market in Hour h resulting from differences between Non-Excessive Energy and the Day-Ahead Schedule for Energy) + (revenue or charges in the Real-Time Energy and Operating Reserve Market in Hour h resulting from differences between Dispatch Targets for Operating Reserves and Day-Ahead Schedules for Operating Reserve) - (Energy Offer cost reduction or increase resulting from differences between Non-Excessive Energy and the Day-Ahead Schedule for Energy) – (Operation Reserve Offer Cost reduction or increase in Hour h resulting from differences between Dispatch Targets for Operating Reserves and Day-Ahead Schedules for Operating Reserve adjusted for the Self Schedule for the applicable Operating Reserves) – (No Load Offer cost and prorated Start Up Offer cost in Hour h for Resources eligible for Real-Time Revenue Sufficiency Guarantee Credit)}.

Step 4: Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit in Hour h is the sum of the Day-Ahead component and the Real-Time component:

$(\text{Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit})_h$

$=(\text{Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit})_h^{DA}$

$+ (\text{Undeployed Regulating Mileage Revenue Sufficient Guarantee Credit})_h^{RT}$