

140 FERC ¶ 61,067
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;
Philip D. Moeller, John R. Norris,
and Cheryl A. LaFleur.

Midwest Independent Transmission
System Operator, Inc.

Docket No. ER12-668-000

ORDER CONDITIONALLY ACCEPTING TARIFF REVISIONS

(Issued July 20, 2012)

1. On December 22, 2011, pursuant to section 205 of the Federal Power Act (FPA)¹ and Part 35 of the Commission's regulations,² Midwest Independent Transmission System Operator, Inc. (MISO) filed proposed revisions to its Open Access Transmission, Energy, and Operating Reserve Markets Tariff (Tariff) to improve the accuracy of pricing in its energy and operating reserve markets by allowing a greater variety of resources to set the locational marginal price (LMP) in its day-ahead and real-time energy markets as well as the market clearing price (MCP) in its day-ahead and real-time operating reserve markets (collectively, clearing prices). As discussed below, we conditionally accept MISO's filing, subject to compliance filings due 30 days and 120 days after the date of this order and to the outcome of the proceedings in Docket Nos. ER12-1265-000 and ER12-1266-000.

I. Background and Proposed Tariff Revisions

2. MISO states that it currently utilizes a security-constrained economic dispatch (SCED) algorithm to schedule and dispatch generation resources in its day-ahead and real-time markets. MISO states that the SCED algorithm is also used to calculate the clearing prices for the energy and operating reserve markets.³

¹ 16 U.S.C. § 824d (2006).

² 18 C.F.R. Part 35 (2011).

³ Gribik Test. at 3-5.

3. However, MISO explains that the existing SCED algorithm frequently does not allow certain resources to set clearing prices. Consequently, clearing prices may not reflect the highest-cost resources deployed by MISO to satisfy demand.⁴ For instance, MISO states that the SCED algorithm does not allow generators or demand response resources that are block loaded resources,⁵ resources dispatched at their economic minimum or maximum limits, or available off-line resources to set day-ahead or real-time clearing prices.⁶ Similarly, MISO states that real-time clearing prices produced by the SCED algorithm may not reflect offers from Emergency Demand Response resources.⁷ MISO states that clearing prices do not currently reflect the start-up offer costs and the no-load offer costs for generation resources or Demand Response Resources Type II. Similarly, clearing prices may not reflect the shut-down offer costs and hourly curtailment offer costs of Demand Response Resources Type I.⁸ MISO states that

⁴ MISO December 22, 2012 Filing at 2 (December 22 Filing).

⁵ MISO explains that a block loaded resource is a resource that can only be dispatched at a specific megawatt (MW) output. *Id.* at 2 n.3. A block-loaded demand response resource would be a Demand Response Resource Type I resource.

⁶ *Id.* at 2. Off-line resources that MISO proposes to include in Extended LMP price determination are resources that are available for commitment and dispatch, and not, for example, resources that are off-line for maintenance.

⁷ Emergency Demand Response is established in Schedule 30 of MISO's Tariff. Schedule 30 provides for the commitment and dispatch of interruptible demand, behind-the-meter generation and other demand resources that are capable of helping to meet the energy balance during NERC Energy Emergency Alert 2 (declared by Balancing Authorities for deficient capacity and energy during peak load periods) or Energy Emergency Alert 3 (firm load interruptions due to capacity and energy deficiency) events. Schedule 30 establishes that a market participant within MISO's region may become an Emergency Demand Response participant by complying with the Schedule 30 requirements if it: (i) has the ability to cause a reduction as either operator of a facility, or as a load serving entity or aggregator of retail customers that has a contract that entitles it to reduce load at such a facility; or (ii) can cause an increase in output from a behind-the-meter generation resource to enable a net demand reduction, in response to receiving an Emergency Demand Response instruction from MISO.

⁸ Gribik Test. at 5. In this order, we will refer to these start-up and no-load costs (and shut-down and curtailment costs of Emergency Demand Resources and Demand Response Resources Type I) as "commitment costs."

because these costs are not reflected in clearing prices, it provides make-whole credits to certain resources at certain times in order to ensure that they recover their offer costs.⁹

4. MISO explains that the most expensive resource needed to satisfy demand may be a block loaded resource. According to MISO, in some cases, the block loaded resource's economic minimum limit may provide more energy than is necessary to satisfy demand. MISO states that the existing SCED algorithm requires it to "back down" a less expensive resource in such a situation in order to balance supply and demand. However, MISO states that because the SCED algorithm does not permit block loaded resources to set clearing prices in such a case, "the resulting LMP would thus reflect the cost of the less expensive Resource that is backed down, rather than the cost of the more expensive [block loaded resource] that MISO actually committed and dispatched to meet system demand."¹⁰

5. MISO asserts that clearing prices produced by the SCED algorithm also may reflect shortage prices, resulting in transitory price increases, even though MISO is not actually short of capacity and when it could commit a combustion turbine resource to address the perceived shortage.¹¹ MISO states that such elevated prices frequently disappear before market participants have an opportunity to respond. MISO concludes that, under these circumstances, clearing prices may not accurately reflect the cost of actions that MISO would take to alleviate the shortage problem if such a condition were to persist. MISO states that such prices can be viewed as artificial because MISO often has available resources that it could commit at a cost that is less than the shortage cost that is used to set clearing prices.¹²

6. In order to ensure that clearing prices more accurately reflect the cost of actions taken by MISO to meet energy and operating reserve requirements, MISO proposes to calculate clearing prices pursuant to its new Extended LMP methodology, described in a new Schedule 29A in the Tariff.¹³ Under the Extended LMP methodology, MISO will

⁹ *Id.*

¹⁰ December 22 Filing at 2.

¹¹ *Id.*

¹² *Id.* at 3.

¹³ In its December 22 Filing, MISO refers to the proposed methodology as the SCED-Pricing algorithm or methodology. However, in order to avoid possible confusion between the SCED algorithm and the SCED-Pricing algorithm, we will refer to MISO's proposal as the Extended LMP methodology or algorithm.

allow certain block loaded resources and resources dispatched at limits to set day-ahead and real-time prices for energy and operating reserves. MISO will allow committed Emergency Demand Resources to set prices in the real-time market. Under MISO's Extended LMP methodology, the commitment costs of these resources (or portion thereof in case of a partial commitment¹⁴), in addition to incremental energy and operating reserve offer costs, would be considered in the day-ahead and real-time calculation of Extended LMPs as discussed below. MISO states that its proposal will not alter its current scheduling and dispatch procedures; MISO will continue to utilize the SCED algorithm for these purposes.¹⁵ After the adoption of Extended LMP, the prices produced by the SCED algorithm in the course of scheduling and dispatching resources would be referred to as Ex Ante prices, and would be utilized for informational purposes only.¹⁶ MISO will calculate clearing prices, which MISO refers to as Ex Post prices, using the new Extended LMP algorithm.¹⁷ These Ex Post prices will be used for settlement.

7. For the purpose of implementing its Extended LMP methodology, MISO proposes to define a new category of resources referred to as "Fast Start Resources," that can respond within ten minutes to provide energy or, in the case of a demand response resource, to reduce consumption.¹⁸ Fast Start Resources, along with Emergency Demand Response resources, will be considered in developing Extended LMPs. MISO will consider the costs of these resources in calculating Extended LMPs in order to develop clearing prices that more accurately reflect the costs of the most expensive action that MISO would need to take to meet system requirements. MISO states that proposed Extended LMP pricing would tend to "smooth out" energy and operating reserves pricing by considering the actions that MISO could take to address transient problems by committing units that can respond quickly, even though such resources may not be on-line at that moment.¹⁹

¹⁴ Under the Extended LMP methodology, resources can be selected to run at less than their block loaded level or at less than their economic minimum. While commitment does not actually occur with the Extended LMP methodology, this is referred to as partial commitment.

¹⁵ December 22 Filing at 5 (citing Gribik Test. at 8).

¹⁶ Vannoy Test. at 5.

¹⁷ *Id.*

¹⁸ These resources would also have a minimum run time of one hour or less. The complete definition of such resources is discussed later in this section.

¹⁹ December 22 Filing at 3.

8. In the Day-Ahead Market, in addition to incremental energy offer costs and operating reserve offer costs, the Extended LMP methodology will permit commitment costs to be considered in setting Extended LMPs for on-line Fast Start Resources committed in the Day-Ahead Market. These costs would also be considered for available off-line Fast Start Resources when there are shortages or transmission violations in the day-ahead dispatch.²⁰ However, the Extended LMP algorithm would not consider commitment costs submitted by on-line must-run Fast Start Resources and on-line resources that are not Fast Start Resources, and would only consider incremental energy offer costs and operating reserve offer costs of these resources.²¹ Further, MISO proposes to “allow Fast Start Resources to relax their dispatch minimums to zero by allowing the partial commitment of such resources for pricing purposes.”²²

9. MISO also proposes various revisions to the Real-Time Market. Like the day-ahead Extended LMP calculation, the real-time Extended LMP calculation would consider commitment costs, incremental energy offer costs, and operating reserve offer costs for on-line Fast Start Resources committed by MISO in the Reliability Assessment Commitment process. These same costs would be considered for available off-line Fast Start Resources as well when there are shortages or transmission violations in the real-time dispatch.²³ However, only incremental energy offer costs and operating reserve offer costs for must-run Fast Start Resources and on-line non-Fast Start Resources would be considered in the Extended LMP algorithm.²⁴ If called upon, Emergency Demand Response resources scheduled by MISO would participate in setting clearing prices in the real-time markets by consideration of their shut-down offer costs and reduction offer costs.²⁵ Partial commitments of Fast Start Resources and Emergency Demand Resources would be allowed in developing Extended LMP clearing prices.

10. MISO’s proposal defines a “Fast Start Resource” as:

[a] Generation Resource that can be started, synchronized and inject Energy, or a Demand Response Resource that can reduce its Energy consumption, within [ten] minutes of being notified

²⁰ *Id.* at 11.

²¹ *Id.*

²² *Id.*

²³ *Id.* at 12.

²⁴ *Id.*

²⁵ *Id.*

and that has a minimum run time of one hour or less that will participate in setting price as described in the process in Schedule 29A of [the] Tariff.²⁶

MISO asserts that the proposed ten-minute criterion for the definition of Fast Start Resources is appropriate because MISO's real-time dispatch procedures look ahead ten minutes and the decision to commit a Fast Start Resource would generally occur at the same time MISO makes dispatch decisions for all committed resources.²⁷ However, in developing the Extended LMP methodology, MISO and its stakeholders discussed adopting a 30-minute availability criterion for Fast Start Resources and adopting different criteria for available off-line and on-line Fast Start Resources. MISO states that it will evaluate these concepts as potential future improvements once it has gained sufficient experience with the proposed methodology.²⁸

11. MISO notes that, under its existing Tariff, eligible resources are guaranteed recovery of certain offer costs via three make-whole credit mechanisms: Day-Ahead and Real-Time Revenue Sufficiency Guarantee credits, Day-Ahead Margin Assurance Payments, and Real-Time Offer Revenue Sufficiency Guarantee Payments. MISO proposes to make: (1) must-run resources; (2) price sensitive demand bids; (3) virtual transactions; and (4) dispatchable and up-to-transmission usage charge interchange schedules eligible for Day-Ahead Revenue Sufficiency Guarantee credits associated with Extended LMP. MISO explains that these resources require Day-Ahead Revenue Sufficiency Guarantee credits when *ex ante* to *ex post* decreases or increases in price result in insufficient revenue to cover these resources' offered costs. According to MISO, revisions to its real-time make-whole credits are unnecessary.²⁹

12. MISO states that it is "currently planning to conduct parallel testing of its Extended LMP methodology for a period of about three (3) months."³⁰ During this period, MISO states that it will post non-binding, indicative Ex Post prices, settlement statements and Revenue Sufficiency Guarantee billing determinants. MISO posits that this information will allow stakeholders to compare clearing prices determined by the SCED algorithm to clearing prices calculated pursuant to the Extended LMP

²⁶ December 22 Filing at 10.

²⁷ *Id.* at 4.

²⁸ *Id.*

²⁹ *Id.* at 12-13.

³⁰ *Id.* at 7.

methodology. MISO proposes to implement Extended LMP immediately after the parallel testing period, without a pilot period.

13. MISO explains that it developed the proposed Extended LMP methodology in response to the recommendation of MISO's Independent Market Monitor and in conjunction with several of its stakeholder committees and informal working groups.³¹ MISO specifically highlights the efforts of the ELMP Task Team over the course of the past two years to develop the Extended LMP methodology. MISO states that in December 2011 the ELMP Task Team and the Market Subcommittee voted to submit the Extended LMP methodology for approval.³²

14. MISO states that it and its stakeholders also considered adopting "Full Extended LMP," which would allow all resources that are operated at limits to participate in setting prices, and would consider inter-temporal effects and costs related to multiple-interval dispatch. However, MISO ultimately determined that it would implement Extended LMPs in a staged approach, beginning with its current proposal. MISO states that it may consider "Full Extended LMP" features, along with the planned implementation of Look Ahead Dispatch, in the future.³³

15. During its stakeholder process, MISO provided theoretical results as well as case studies of market results under the Extended LMP methodology to the ELMP Task Team. However, the degree of price increase, changes to make whole payments, and use of shortage pricing associated with Extended LMP can not be known prior to implementation. MISO notes that it will report results to the Market Subcommittee and either of the remaining ELMP Task Team or the RSG Task Team on a monthly basis. MISO asserts that, one year after implementation of the Extended LMP methodology, it will submit an implementation report illustrating analytical conclusions and recommendations reached by MISO staff. According to MISO, the Independent Market

³¹ December 22 Filing at 5 (citing Potomac Economics, 2005 State of the Market Report for the Midwest ISO, 51 (2006), *available at* http://www.potomaceconomics.com/uploads/midwest_reports/2005%20State%20of%20Market%20Report_Final_Full%20Text.pdf).

³² *Id.* at 7-8. MISO asserts that on December 2, 2011, the ELMP Task Team voted in favor of having MISO file the Extended LMP proposal by a vote of 10 in favor, 3 against, and 16 abstentions. Further, MISO explains that the Market Subcommittee approved the current proposal on December 6, 2011. *Id.* At the December 7, 2011 Advisory Committee meeting, the voting results of the Market Subcommittee meeting were presented to the Advisory Committee.

³³ *Id.* at 5.

Monitor will be given access to all Extended LMP data and the opportunity to add his analysis and recommendations to the implementation report.³⁴

16. MISO requests an effective date of more than 120 days from the date of its filing and thus requests waiver of the Commission's regulations to effectuate such a date.³⁵ Due to the complexity and significant cost of developing software necessary to implement the Extended LMP systems, MISO proposes to develop that software only after the Commission has issued an order accepting the Extended LMP methodology. MISO states that it will file a status report within 120 days of receiving such a favorable order at which time it will provide the date when MISO will be able to commence operations utilizing the proposed new and revised Tariff provisions.

II. Notice of Filing and Responsive Pleadings

17. Notice of MISO's filing was published in the *Federal Register*, 77 Fed. Reg. 275 (2012), with interventions and comments due on or before January 12, 2012. On January 9, 2012, Midwest TDUs filed a motion to extend the time to file comments. On January 11, 2012 the Commission granted the request for extension of time until January 26, 2012.

18. Alliant Energy Corporate Services, Inc.; American Electric Power Service Corporation (AEP);³⁶ Calpine Corporation; Coalition of Midwest Transmission Customers; Constellation Energy Commodities Group, Inc. and Constellation NewEnergy, Inc.; Consumers Energy Company; The Detroit Edison Company; Dynegy Power Marketing, LLC; Edison Mission Energy; Exelon Corporation; Hoosier Energy Rural Electric Cooperative, Inc.; Illinois Municipal Electric Agency; Indiana Municipal Power Agency; Wisconsin Public Service Corporation, Upper Peninsula Power Company, and Integrys Energy Services, Inc.; Michigan Public Power Agency and Michigan South Central Power Agency; MidAmerican Energy Company; and WPPI Energy filed timely motions to intervene. In addition, Ameren Services Company on behalf of Ameren Energy Marketing Company, Ameren Illinois Company, and Union Electric Company (collectively, Ameren); American Municipal Power, Inc. (AMP); DC Energy Midwest, LLC (DC Energy); Westar Energy, Inc. (Westar); and Wisconsin

³⁴ *Id.* at 7-8 n.18.

³⁵ *See id.* at 13-14; 18 C.F.R. § 35.3(a) (2011).

³⁶ AEP submitted the filing on behalf of Appalachian Power Company, Indiana Michigan Power Company, Kentucky Power Company, Kingsport Power Company, Ohio Power Company, and Wheeling Power Company.

Electric Power Company (Wisconsin Electric) filed timely motions to intervene and comments. Midwest TDUs filed a timely motion to intervene and protest.³⁷

19. Illinois Commerce Commission, Indiana Utility Regulatory Commission, Michigan Public Service Commission, and Missouri Public Service Commission filed notices of intervention. In addition, Organization of MISO States (OMS) filed a notice of intervention and comment.

20. On January 27, 2012, Xcel Energy Services Inc. (Xcel) filed a motion to intervene out-of-time and comments.³⁸ On February 3, 2012, NextEra Energy Resources, LLC (NextEra) filed a motion to intervene out-of-time.

21. On February 10, 2012, MISO filed an answer to the comments and protests. On February 27, 2012, Midwest TDUs filed an answer to MISO's answer.

III. Procedural Matters

22. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2012), the notices of intervention and timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. Pursuant to Rule 214(d) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214(d) (2012), we will grant the late-filed motions to intervene filed by Xcel and NextEra given their interests in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay.

23. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2012), prohibits an answer to a protest or an answer unless otherwise ordered by the decisional authority. We will accept the answers submitted by MISO and Midwest TDUs because they have provided information that assisted us in our decision-making process.

IV. Discussion

24. For the reasons discussed below, we conditionally accept MISO's proposal, subject to the submission of compliance filings due 30 days and 120 days after the date of this order and to the outcome of the proceedings in Docket Nos. ER12-1265-000 and ER12-1266-000.

³⁷ Midwest TDUs participating in this proceeding consist of Madison Gas & Electric Company and Missouri Joint Municipal Electric Utility Commission.

³⁸ Xcel submitted the filing on behalf of Northern States Power Company, a Minnesota corporation; and Northern States Power Company, a Wisconsin corporation.

A. Extended LMP Methodology

1. Comments and Protests

25. Ameren, DC Energy, Westar, Wisconsin Electric, and Xcel generally support the Extended LMP proposal.³⁹ Ameren, DC Energy, and Xcel state that MISO's proposal is expected to reduce Revenue Sufficiency Guarantee costs.⁴⁰ DC Energy notes that the proposal is expected to enable the costs associated with additional resources to be appropriately included in price signals and that the proposal will minimize implementation costs, development time, and risks by using existing software. DC Energy requests that the Commission approve MISO's plan to file a status report that will provide an implementation date and associated work plan.⁴¹

26. Xcel notes that the proposal was developed through MISO's stakeholder process in response to the recommendations of MISO's Independent Market Monitor. Xcel maintains that the proposal will more accurately reflect the costs of committing Fast Start Resources to alleviate transient shortages and to meet system requirements by operating at their economic minimum limits. Xcel contends that, by more accurately calculating prices, MISO's proposal will result in more reliable, clearer pricing signals to market participants and help improve price predictability.⁴²

27. Ameren believes that MISO's proposal will provide more accurate and transparent price signals and improve the overall functioning of MISO's markets. Ameren supports the ability of Fast Start Resources and Emergency Demand Response resources to set prices, stating that paying a lower price and making up the difference via uplift "mutes effective price signals and disguises the true cost of dispatch . . . to the detriment of energy consumers."⁴³ Ameren supports the inclusion of commitment costs in the calculation of settlement prices, arguing that including these costs will allow market clearing prices to better reflect the actual cost of the marginal unit. Ameren also contends that the Extended LMP proposal will improve pricing accuracy by decreasing the

³⁹ Ameren Comments at 3; DC Energy Comments at 3; Westar Comments at 2, 4; Wisconsin Electric Comments at 3; Xcel Comments at 5.

⁴⁰ Ameren Comments at 4; DC Energy Comments at 3; Xcel Comments at 5.

⁴¹ DC Energy Comments at 3.

⁴² Xcel Comments at 4-5.

⁴³ Ameren Comments at 3-4.

likelihood that shortage pricing will be triggered when there is no actual shortage (i.e., when Fast Start Resources are available to alleviate the constraint).⁴⁴

28. Nonetheless, Ameren believes that MISO should continue to pursue “Full Extended LMP.”⁴⁵ Ameren argues that “Full Extended LMP” would better reflect true market clearing prices and minimize the use of uplift charges to make suppliers whole. Ameren agrees with MISO’s decision not to pursue “Full Extended LMP” at this time but notes that there are several initiatives at MISO (e.g., Look Ahead Dispatch) that may make the step toward “Full Extended LMP” less complex and costly. Ameren contends that the Commission should encourage MISO to continue its study of “Full Extended LMP” implementation and update the MISO Market Subcommittee on the study’s findings.⁴⁶

29. Westar supports MISO’s Extended LMP proposal because it will more closely reflect the cost of serving load. In particular, Westar supports the inclusion of Fast Start Resources and commitment costs in the calculation of clearing prices. Westar also hopes that Extended LMPs will reduce Day-Ahead and Real-Time Revenue Sufficiency Guarantee costs.⁴⁷

30. Midwest TDUs argue that MISO has not demonstrated that the Extended LMP proposal will benefit consumers, given that higher prices will result from the upward adjustment of the marginal cost associated with the specified Fast Start Resources, and that infra-marginal resources will receive those higher prices.⁴⁸ In support of this conclusion, they maintain that because Extended LMPs are calculated only after the dispatch has already been determined by the SCED software, MISO’s Extended LMP proposal reallocates wealth between resource owners and load, without directly affecting dispatch efficiency. Further, Midwest TDUs assert that the Extended LMP algorithm would not promote the “generic justification” for the payment of clearing prices which Midwest TDUs suggest is the deterrence of strategic bidding.⁴⁹ Midwest TDUs argue that block loaded resources, Fast Start Resources, and Emergency Demand Response resources are unable to submit strategic commitment costs in the situations when pricing

⁴⁴ *Id.* at 4.

⁴⁵ *Id.* at 6 (citing MISO December 22 Filing at 4-5; Gribik Test. at 8-9).

⁴⁶ *Id.* at 6-7.

⁴⁷ Westar Comments at 2-3.

⁴⁸ Midwest TDUs Protest at 1-2.

⁴⁹ *Id.* at 8-13.

under the proposed Extended LMP algorithm would differ from that under the existing SCED algorithm, and thus they need not be paid the clearing price. Midwest TDUs state that resources cannot reliably predict when they will be the resource that sets the clearing price.⁵⁰

31. In addition, Midwest TDUs posit that Extended LMP pricing will complicate implementation of policy initiatives designed to benefit consumers, including the deployment of smart meters. Midwest TDUs state that use of the Extended LMP methodology will increase the extent to which *ex post* prices charged to load differ from *ex ante* prices made visible to load before it operates. Midwest TDUs maintain that this will allow prices to increase after a purchase commitment is made, which will decrease participation in smart meter programs.⁵¹

2. Answers

32. In response to Ameren, MISO agrees to continue to study and to work with its stakeholders to discuss the potential advantages of implementing “Full Extended LMPs” at a later date.⁵²

33. In response to Midwest TDUs, MISO states that the LMP calculated by the SCED algorithm is not a true market clearing price because it may not provide the incentive for block loaded resources to follow dispatch instructions and can lead to Revenue Sufficiency Guarantee credits for those resources.⁵³ MISO explains that because the SCED algorithm does not allow all resources to participate in setting the price of energy or operating reserves, those prices do not cover the costs considered in deploying resources in the market.⁵⁴ As a result, Revenue Sufficiency Guarantee credits must be

⁵⁰ *Id.* at 8-13. Midwest TDUs posit that, for example, the seller of a block loaded resource cannot confidently predict that the system operator will be put to a choice between dispatching that resource and backing down a less expensive resource. Midwest TDUs argue that the choice arises only from the untidiness of actual system operations, and thus a supplier that is not block loaded or at its system limits would have the incentive to bid its marginal cost.

⁵¹ In particular, Midwest TDUs note that Emergency Demand Response resources’ offers “must be finalized by no later than 11 a.m. of the day ahead, and therefore cannot be changed based on later-arising information.” *Id.* at 11.

⁵² MISO Answer at 10.

⁵³ *Id.* at 4 (citing Gribik Test. at 4-5).

⁵⁴ *Id.*

paid to those resources that are excluded from the SCED algorithm. MISO argues that the Extended LMP proposal is just and reasonable because a block loaded resource that responds to a least cost commitment and dispatch should be able to participate in setting a price to which it should be able to respond. Moreover, MISO states that the approach is consistent with MISO's Independent Market Monitor's assessment in many of its State of the Market Reports.⁵⁵ MISO states that without Extended LMP methodology, Fast Start Resources that are block loaded or dispatched at limits would be able to recover their offer costs due to make whole payments, and thus they would be able to bid strategically. "In short, [Extended LMP] will improve the pricing signals and thus create a more efficient market operation."⁵⁶

34. Furthermore, MISO asserts that paying infra-marginal resources Revenue Sufficiency Guarantee credits results in those resources being paid as bid, which could lead to strategic bidding. MISO thus concludes that the Extended LMP methodology would reduce the likelihood of strategic bidding by reducing Revenue Sufficiency Guarantee credits.⁵⁷

35. In response to MISO's answer, Midwest TDUs argue that the Commission's policy only allows generators to set and be paid the market clearing price where doing so advances consumer welfare by removing the incentive for strategic offers, that is, in circumstances where "suppliers know that they are going to receive only what they [offer]."⁵⁸ Further, Midwest TDUs assert that under MISO's existing Tariff, resource owners do not know when they submit their offers whether their resource will set the clearing price and, therefore, already have an incentive to offer at their true marginal cost. For this reason, Midwest TDUs question whether MISO's proposal will advance consumer welfare.⁵⁹

36. Midwest TDUs also argue that it is unclear how market participants could utilize published information concerning Revenue Sufficiency Guarantee credits to determine whether their resource would receive Revenue Sufficiency Guarantee credits.⁶⁰ Thus,

⁵⁵ *Id.*

⁵⁶ *Id.* at 5.

⁵⁷ *Id.* at 5-6.

⁵⁸ Midwest TDUs Answer at 2 (citing *San Diego Gas and Elec. Co. v. Sellers of Energy*, 95 FERC ¶ 61,115, at 61,362 (2001)).

⁵⁹ *Id.* at 2-3.

⁶⁰ *Id.* at 3-4.

Midwest TDUs assert that it is “far from clear” how an infra-marginal generator could utilize such information to bid strategically. Midwest TDUs state that MISO’s information on Revenue Sufficiency Guarantee credits is aggregated, so that each market participant is not informed about what any particular market participant receives. Midwest TDUs argue that if such information can be used to submit strategic offers, then this behavior should already be occurring and MISO could have submitted evidence of such current strategic offering. Midwest TDUs add that none of MISO’s assertions about strategic offers are supported by, or consistent with, testimony, which states that Extended LMPs will not modify MISO’s operations or dispatch.

3. Commission Determination

37. As discussed below, we will conditionally accept MISO’s proposal because the Extended LMP methodology will result in clearing prices that decrease incentives for strategic behavior and more accurately reflect the cost of actions taken by MISO to satisfy demand. We disagree with Midwest TDUs’ argument that, because block loaded resources, Fast Start Resources, and Emergency Demand Response resources cannot reliably predict when they will receive uplift credits, such resources cannot improve their profits using strategic commitment cost bids. If there is a likelihood that a resource owner may receive pay-as-bid Revenue Sufficiency Guarantee credits under the existing LMP pricing, even if that owner does not know in which periods such credits will be received, the owner may be able to develop strategic offers that increase its expected Revenue Sufficiency Guarantee payments. By including more resources in the determination of clearing prices, the Extended LMP methodology should reduce the likelihood that a given resource will receive pay-as-bid Revenue Sufficiency Guarantee credits, and therefore the Extended LMP methodology does in fact support the “generic justification” for the payment of clearing prices. Nonetheless, prevention of strategic bidding is not the only reason to allow the marginal resource to set the price in the market. It is also important that prices send the correct signals to market participants about when more supply or demand response is needed.

38. Because the SCED algorithm prevents various resources from setting the clearing price, even when those resources represent the last and most costly action taken by MISO, the SCED algorithm may produce an inaccurate price signal. MISO’s Extended LMP methodology, however, will allow a greater range of resources to set clearing prices, and therefore, represents an improvement to the operation of MISO’s energy and operating reserve markets. Whereas the SCED algorithm prohibits Fast Start Resources and Emergency Demand Response resources from setting the clearing price, the Extended LMP methodology would take such resources into consideration. Further, the Extended LMP algorithm will consider commitment costs, including shut-down costs for Emergency Demand Response resources. Additionally, the Extended LMP algorithm would allow available off-line Fast Start Resources to set the clearing price in the event of a transient shortage or transmission constraint violation, which the SCED algorithm

prevents. Allowing more resources to set the clearing price if they are on the margin will help prevent the market price from overreacting to transient illusory shortages and from dropping when a block loaded resource is dispatched to address situations when the system becomes tighter. Thus, the Extended LMP algorithm should enhance market signals by allowing prices to better reflect the cost of actions taken to meet system requirements, a result which we find to be just and reasonable.

39. Contrary to the assertions of Midwest TDUs, we believe that consumers should benefit from the Extended LMP methodology. Clearing prices calculated through the Extended LMP algorithm should provide better price signals during periods when the SCED algorithm indicates a shortage or transmission constraint violation but off-line Fast Start Resources or Emergency Demand Resources are available for commitment to alleviate the shortage or violation. This is because Extended LMP pricing would allow the available off-line resource to set the price whereas the SCED algorithm would not. In the near term, MISO's proposal should result in prices that better capture the costs considered in committing and dispatching resources. In the long term, it should send more effective signals about the need for additional resources in the region. By producing a clearing price that better reflects the most expensive action taken to satisfy demand in the region, the Extended LMP algorithm should promote more efficient development of supply and demand resources in the future.

40. Furthermore, because Extended LMP clearing prices should send better market signals to both supply *and* demand resources and because market participants will be notified of real-time Ex Post clearing prices every five minutes, as they are being calculated, we disagree with Midwest TDUs' contention that the proposal would discourage smart meters and other initiatives to bring real-time wholesale price signals to participating retail loads.⁶¹

41. In addition, MISO's proposal is consistent with the recommendation of the Independent Market Monitor. MISO's Independent Market Monitor has stated that a program such as Extended LMP should: (1) improve the efficiency of real-time prices; (2) improve incentives to schedule load fully in the day-ahead market; and (3) reduce Revenue Sufficiency Guarantee costs.⁶² The Independent Market Monitor has also stated that allowing non-dispatchable demand response resources to set real-time energy prices when they are called upon in a shortage should improve price signals in the highest

⁶¹ Gribik Test. at 28.

⁶² Potomac Economics, *2010 State of the Market Report for the MISO Electricity Markets* (2011), http://www.potomaceconomics.com/uploads/midwest_reports/2010_State_of_the_Market_Report_Final.pdf.

demand hours, which is important for ensuring that the markets send accurate economic signals to maintain adequate supply resources and develop additional demand response capability.⁶³

42. However, we will require MISO to address in a compliance filing due 30 days after the date of this order, several issues with regard to the Extended LMP algorithm. First, MISO's proposed definition for Fast Start Resource includes both generation resources and demand response resources that can respond within ten minutes of being notified. MISO also discusses the need to allow block loaded resources to set prices. Block loaded demand response resources are Demand Response Resources Type I and they have shut-down and hourly curtailment costs, rather than start-up and no-load costs. However, MISO's proposed tariff language and algorithms in Schedule 29A for Fast Start Resources appear to exclude Demand Response Resources Type I, as they include only start-up and no-load costs as the Fast Start Resource costs that are considered in Extended LMP pricing. MISO's proposed Schedule 29A does not explicitly include provisions to consider shut-down offer costs or hourly curtailment offer costs for Demand Response Resources Type I in Extended LMP pricing. We will require MISO to revise Schedule 29A in its compliance filing due 30 days after the date of this order to include the appropriate costs of Demand Response Resources Type I that are Fast Start Resources, consistent with the treatment of other Fast Start Resources.

43. Second, in section II of Schedule 29A, MISO describes the scenarios in which off-line Fast Start Resources that are available to be committed in the Day-Ahead market by the Transmission Provider are to be considered in the Extended LMP algorithm. MISO states that the Allocated Share of Start-Up Cost ($AllocatedShareStartUpCost_{hour}$) for available off-line Fast Start Resources will be considered in the objective function, thereby allowing the start-up costs of available off-line Fast Start Resources to impact prices in instances where the SCED algorithm finds a solution with shortages or transmission violations in the day-ahead dispatch, as described in the transmittal letter.⁶⁴ The testimony of Dr. Paul Gribik also indicates that in the Day-Ahead Market, "[t]he Start-Up costs for off-line Fast Start Resources available for commitment will be allocated over their offered minimum run time."⁶⁵ However, section II of Schedule 29A defines $AllocatedShareStartUpCost_{hour}$ as $StartUpCost/N$, "if the hour is within N hours of the time the resource committed" (where N is the minimum run time of the resource).⁶⁶

⁶³ *Id.*

⁶⁴ December 22 Filing at 11.

⁶⁵ Gribik Test. at 29.

⁶⁶ Proposed Schedule 29A, § II (Day-Ahead Pricing Formulations).

44. We find that the proposed Tariff language for defining *AllocatedShareStartUpCost_{hour}* does not accurately define the scenarios in which an available off-line Fast Start Resource can set prices, as explained by MISO in its transmittal letter and in Dr. Gribik's testimony. In particular, if a Fast Start Resource (which by definition has a minimum run time of 1 hour or less) is available and off-line in a given hour, it has not been committed in that hour. Therefore, the Tariff statement "if the hour is within *N* hours of the time the resource committed" cannot hold true for an available off-line resource in any hour. Consequently, no start-up costs for such resources would be considered in the pricing, contrary to MISO's explanation of the consideration of costs associated with available off-line Fast Start Resources.

45. The Tariff language also does not accurately define *AllocatedShareStartUpCost_{hour}* as it relates to available off-line Fast Start Resources in the discussion of the Real-Time Market in section III of Schedule 29A. We will require MISO to revise the definition of *AllocatedShareStartUpCost_{hour}* in its compliance filing due 30 days after the date of this order to describe MISO's intended treatment of available off-line Fast Start Resources, consistent with the description provided in the transmittal letter and in Dr. Gribik's testimony. Alternatively, MISO may otherwise explain why the proposed Tariff language is sufficient to implement the proposal as explained.

46. Third, in the equation defining the Allocated Share of Shut Down Cost Equation, relating to Emergency Demand Response in section III of Schedule 29-A, MISO indicates that:

$$\text{AllocatedShareShutDownCost}_t = \text{ShutDownCost}/N \times (\text{Intervals per Hour}).$$

MISO defines *t* as the real-time Dispatch Interval, and *N* as the period of time in hours for which the Transmission Provider scheduled reduction in Energy consumption from the Emergency Demand Resource.⁶⁷ It appears that MISO's proposed Tariff sheets misplace the parentheses in this equation, distorting the intended pricing results.⁶⁸ In

⁶⁷ Schedule 29A, § III (Emergency Demand Response).

⁶⁸ For instance, suppose an EDR resource has a shut-down cost of \$1,200, is scheduled for 1 hour of reduction (*N*=1) and that there are twelve 5-minute Dispatch Intervals in an Hour. The definition as written would allocate $\text{AllocatedShareShutDownCost}_t = \$1,200/1 \times (12) = \$14,400$ to each 5-minute Dispatch Interval in the hour for pricing purposes. This would allocate 12 times the total shut-down cost to each 5-minute interval. If, instead, the parentheses were moved to place *N* into the denominator of the equation, the start-up cost allocation would be modified as: $\text{AllocatedShareShutDownCost}_t = \$1,200/(1 \times 12) = \$100$ to each 5-minute Dispatch Interval in the hour for pricing purposes.

order to accurately reflect the intended calculations in the Extended LMP methodology, it appears necessary to modify the equation such that it reads:

$$\text{AllocatedShareShutDownCost}_t = \text{ShutDownCost}/(N \times \text{Intervals per Hour})$$

We will require MISO to make this modification or to explain why the currently proposed Tariff language is sufficient to implement the proposal as intended in its compliance filing due 30 days after the date of this order.

47. Fourth, in the discussion of Real-Time Market relating to off-line Fast Start Resources available to be committed, in condition (a) relating to availability to participate in Extended LMP price formation, the proposed Tariff language specifies that one condition that allows available off-line Fast Start resources to set prices in the Real-Time Market occurs when the “SCED algorithm finds a solution that does not meet energy and/or reserve requirements in the hour.”⁶⁹ In its compliance filing due 30 days after the date of this order, we will require MISO to modify this definition to read “in the Dispatch Interval” instead of “in the hour” to reflect sub-hourly Real-Time Dispatch Intervals, or otherwise explain why the currently proposed Tariff language is appropriate.

B. Definition of Fast Start Resources

1. Comments

48. Ameren and Wisconsin Electric support expanding the definition of Fast Start Resources beyond the definition proposed by MISO. Ameren supports broadening the definition to include units capable of responding within 30 minutes but does not object to the proposed ten-minute definition. Ameren states that it understands that the ten-minute definition was driven by the ten-minute look-ahead of MISO’s current real-time dispatch software and Ameren supports MISO’s current exploration of a 30-minute look-ahead unit commitment and dispatch. Ameren requests that the Commission require MISO to submit a report six months after implementation of the Extended LMP methodology to explain the next steps to add 30-minute look-ahead unit commitment and expand the definition of Fast Start Resources to include resources capable of responding within 30 minutes.⁷⁰

49. Wisconsin Electric is concerned that the definition of Fast Start Resources is too narrow and will limit the number of resources that will impact market clearing prices under the proposal. It notes that some MISO stakeholders have suggested that: (1) the

⁶⁹ See Schedule 29A, § III.

⁷⁰ Ameren Comments at 4-5.

definition include resources that are able to respond within 30 minutes; and (2) that MISO adopt different criteria for available off-line and on-line resources through the use of the term “Short Minimum Runtime Resources.” Wisconsin Electric urges the Commission to condition approval of MISO’s proposal on: (1) a filing within six months of the implementation of Look Ahead Commitment and Look Ahead Dispatch to include longer lead time units in the definition of Fast Start Resources; and (2) a filing within twelve months of the implementation of Extended LMPs to include a definition of “Short Minimum Run Time Resources.”⁷¹

50. In contrast, Westar opposes any broadening of the definition of Fast Start Resources. Westar is concerned that using available off-line resources to calculate clearing prices using Extended LMPs could distort the true location-specific production costs of Fast Start Resources that are frequently used to resolve short-term reliability problems.⁷² Westar supports MISO’s proposal only because the definition of Fast Start Resources is limited to resources capable of responding within ten minutes and with minimum run times of one hour or less.⁷³ Westar argues that broadening this definition to allow additional available off-line Fast Start Resources to set prices could depress clearing prices below the production costs for on-line Fast Start Resources, thereby amplifying its price distortion concerns. Westar notes that MISO proposes several data collection initiatives that will allow the comparison of Extended LMP settlements and settlements under MISO’s existing LMP provisions during the parallel testing period and the first year of Extended LMP implementation. Westar requests that the Commission prohibit MISO from making any changes to expand the definition of Fast Start Resources until after the Extended LMP methodology has been in place for at least one year so that these data can be collected and compared. Westar concludes that MISO should determine the impact of the Extended LMP proposal prior to broadening these impacts by expanding the Fast Start Resources definition.⁷⁴

⁷¹ Wisconsin Electric Comments at 3-4.

⁷² Westar Comments at 3.

⁷³ Westar argues that available off-line resources “with longer response times and longer minimum run times can have lower incremental production costs but are uneconomical for MISO to commit because they neither start fast nor can be turned off quickly after the reliability event is resolved.” *Id.* at 3 n.1.

⁷⁴ *Id.* at 4.

2. Answer

51. MISO contends that the proposed definition of Fast Start Resources is aligned with the dispatch requirements of MISO operators. MISO states that it has proposed a conservative implementation to avoid any potential market distortion, and to provide several data collection initiatives allowing MISO and market participants to compare Extended LMP settlements with the existing LMP settlements during the parallel testing period and the first year of Extended LMP implementation. MISO maintains that the Commission should not require MISO to make any changes to the definition of Fast Start Resources until after the Extended LMP methodology has been in place for at least a year, so that adequate data can be collected and analyzed. MISO states that this will enable MISO to determine the true impact of its proposal before broadening the impact by potentially expanding the definition of Fast Start Resources.⁷⁵

52. In response to Westar, MISO argues that it is beyond the scope of this proceeding to request that the Commission prevent MISO from making a filing at some future time. MISO states that this request could restrict its ability to fulfill its obligations as a Regional Transmission Organization, as it continually studies the markets and works with its stakeholders to allow for the most efficient and fair operation and dispatch.⁷⁶

3. Commission Determination

53. We will accept MISO's proposed definition of Fast Start Resources and will not require MISO to modify this definition or add related terms to its Tariff. MISO explains that the definition is consistent with the ten-minute look-ahead period in its current real-time dispatch.⁷⁷ We find that it is appropriate to allow locational prices to reflect the costs from resources that are capable of being committed in the same time frame in which MISO makes dispatch decisions because the costs of committing and dispatching these resources may reflect the last actions taken to balance supply and demand over that time frame.

54. In response to Ameren and Wisconsin Electric's arguments that the definition should be expanded to include resources capable of responding within 30 minutes, we note that MISO has committed to work with stakeholders to consider this change in the future, at a time when other production changes have allowed MISO to better align the

⁷⁵ MISO Answer at 11-12.

⁷⁶ *Id.* at 12.

⁷⁷ December 22 Filing at 4.

commitment of 30-minute resources with dispatch decisions.⁷⁸ Similarly, with respect to Wisconsin Electric's request that MISO be required to make a filing within 12 months of the implementation of Extended LMP to create different criteria for on-line and available off-line resources through a new definition, "Short Minimum Runtime Resources," MISO has indicated that it will evaluate this modification as a potential enhancement after it has gained experience with the Extended LMP algorithm in its proposed form.⁷⁹ MISO and its stakeholders should be allowed to evaluate the Extended LMP methodology in testing and in operation before determining whether additional changes could enhance the proposal. In addition, it is important that MISO and its stakeholders be allowed to define appropriate timelines for any potential enhancements, and to prioritize any modifications to the methodology among their various initiatives.

C. Parallel Testing and Reporting

1. Comments and Protests

55. Ameren, AMP, Midwest TDUs, OMS, and Westar support MISO's proposal to provide a period of parallel testing before the final implementation of the Extended LMP algorithm.⁸⁰ OMS urges the Commission to ensure that the parallel testing period proposed by MISO is retained due to the uncertain results of the Extended LMP proposal.⁸¹

56. Ameren believes that stakeholders will benefit from complete transparency during the parallel testing period. Ameren argues that parallel testing will be critical to understanding the potential differences between the clearing prices calculated by the SCED algorithm and Extended LMP calculations, as well as to allow market participants to validate the Extended LMP calculation, verify the Extended LMP methodology, and understand the impact on uplift payments. Ameren requests that the Commission hold MISO to its commitment to provide full and complete settlement statements during the

⁷⁸ *Id.* ("MISO will work with its stakeholders to consider extending the Fast Start Resource definition to 30 minutes after Look Ahead Commitment ('LAC') and Look Ahead Dispatch ('LAD') are in production, in part, because these initiatives will enhance the ability of MISO to utilize 30-minute resources.").

⁷⁹ *Id.* ("MISO will evaluate these concepts as a potential future improvement once there has been sufficient experience with the proposed methodology.").

⁸⁰ Ameren Comments at 6; AMP Comments at 4; Midwest TDUs Protest at 14; OMS Comments at 1-2; Westar Comments at 4.

⁸¹ OMS Comments at 1-2.

parallel testing period, including Revenue Sufficiency Guarantee and other uplift comparisons, to the extent permitted by the settlement software.⁸² Ameren argues that the Commission should require MISO to file a report on the performance of the Extended LMP program six months after its implementation. Ameren states that this filing should include nodal price differentials and impacts on uplift charges and outline next steps for market design improvements to improve the accuracy of price signals. Ameren suggests that these next steps should include timelines for transitioning to “Full Extended LMP,” implementing Look Ahead Dispatch, and expanding the definition of Fast Start Resources to include resources capable of responding within 30 minutes.⁸³

57. AMP states that the parallel testing period is a reasonable way to determine the effectiveness of implementing the Extended LMP methodology. However, AMP maintains that it would be more appropriate for MISO to conduct the testing over a longer period of time, so that it “encompasses differences in load levels and load-change patterns experienced at different times of the year.”⁸⁴ AMP further requests that MISO provide additional information with respect to a plan to revert to the existing SCED algorithm “if, after implementation of the [Extended LMP] methodology, MISO determines that the [SCED algorithm] is more effective than the proposed [Extended LMP] methodology.”⁸⁵ AMP is concerned that MISO may determine that the existing SCED algorithm is a more accurate measure for establishing locational prices or that the Extended LMP methodology will not produce the desired results. AMP maintains that it would be unjust and unreasonable for MISO to continue to use the Extended LMP methodology if, in fact, the SCED algorithm is more accurate.⁸⁶

58. Midwest TDUs join OMS in supporting a parallel testing period before MISO implements the Extended LMP methodology, but maintain that the Commission should not approve the Extended LMP proposal before the completion of parallel testing. Noting that MISO does not propose a specific effective date for the proposed Tariff revisions, and asks that the Commission approve these revisions without modification or

⁸² Ameren Comments at 5-6.

⁸³ Ameren Comments at 7-8.

⁸⁴ AMP Comments at 5 n.2.

⁸⁵ *Id.* at 6.

⁸⁶ *Id.* at 5-6.

hearing and prior to parallel testing,⁸⁷ Midwest TDUs argue that MISO would have the Commission approve a pricing change before testing its effect. They contend that there is substantial uncertainty as to whether MISO's proposal would benefit consumers on balance and urge the Commission to reserve judgment as to whether the Extended LMP proposal is just and reasonable until after the parallel testing is completed. Midwest TDUs maintain that MISO should file the parallel testing results and that the Commission should approve the Extended LMP proposal only if those results show that the Extended LMP methodology will improve market efficiency and consumer welfare. Midwest TDUs state that if such testing were to result in MISO's proposal not being approved, MISO should not necessarily have its software development costs disallowed as imprudent.⁸⁸ In addition, Midwest TDUs state that it might be reasonable to include within the parallel testing period, as a pilot program, sample times when markets would actually settle based on the Extended LMP methodology.⁸⁹

2. Answers

59. MISO opposes Midwest TDUs' request that the Commission reserve judgment regarding the Extended LMP proposal until after the parallel testing period is completed. MISO states that the parallel testing period will assist market participants by providing them with familiarity regarding the pricing signals provided by the Extended LMP algorithm, but it is unlikely that market participants will significantly change any bidding behavior until the price signals have actual economic consequences. Therefore, MISO maintains that it is incorrect to claim that the Commission could evaluate potential changes to bidding behavior prior to the implementation and operation of the Extended LMP methodology.⁹⁰

60. In response to Ameren, MISO states that it remains committed to providing complete settlement statements during the parallel testing period. MISO states that it has appropriately conditioned its delivery of such settlement data upon its ability to do so with its existing software, as there are software limitations and bidding behavior limitations during parallel testing that will not fully reflect changes due to the Extended

⁸⁷ Midwest TDUs add that they believe MISO's filing is more in the nature of a petition for a declaratory order than a filing under section 205 of the FPA, as MISO requests that the Commission accept the proposed Tariff revisions without modification or hearing and does not proposed a specific effective date. Midwest TDUs Protest at 13.

⁸⁸ *Id.* at 13-14.

⁸⁹ *Id.* at 14 n.18.

⁹⁰ MISO Answer at 9.

LMP methodology.⁹¹ MISO states that it will continue to study clearing prices calculated through the Extended LMP algorithm during the parallel testing period, but notes that parallel testing will not necessarily reflect actual changes in offer behavior. MISO believes that a compliance report is superfluous because it will continue to study Extended LMPs and work with stakeholders during the parallel testing period and through the implementation date for the Extended LMP proposal. Nonetheless, MISO is willing to prepare a parallel operations report, if requested by the Commission.⁹²

61. In response to AMP, MISO states that the request for a reversion plan ignores the economic necessity of the Extended LMP improvements to the energy and operating reserve markets. MISO does not object to the parallel testing period so that stakeholders can better understand the impacts of the Extended LMP methodology, though it is concerned that such results may be misinterpreted. MISO maintains that market participants may not make the same sort of offers during the parallel testing period and after the Extended LMP methodology has been fully implemented. MISO notes that, if a stakeholder objects to the price signals produced by the Extended LMP algorithm, it may file a complaint under section 206 of the FPA. MISO contends that it would be improper for the Commission “to approve a revised methodology based upon sound economic theory and market design while concomitantly setting up what amounts to an ‘automatic escape hatch.’”⁹³

62. Midwest TDUs respond that the evidence presented in this proceeding is an insufficient basis to conclude that consumers should pay substantially higher prices that, according to MISO’s own examples, will result from the Extended LMP methodology. Midwest TDUs maintain that the Commission should provide for empirical testing, consistent with their recommendation. They argue that MISO’s objection—that market participants will not alter their bidding behavior until after implementation—is satisfied by their suggestion to include within the testing period, as a pilot program, times when the markets would be settled based on the Extended LMP methodology. Midwest TDUs note that the Commission has previously provided for such pilot testing, and should do so here.⁹⁴

⁹¹ *Id.* at 8.

⁹² *Id.* at 10-11.

⁹³ *Id.* at 8.

⁹⁴ Midwest TDUs Answer at 4 (citing, *e.g.*, *Wholesale Competition in Regions with Organized Electric Markets*, Order No. 719, FERC Stats. & Regs. ¶ 31,281 (2008), *order on reh’g*, Order No. 719-A, 74 Fed. Reg. 37,776 (Jul. 29, 2009), FERC Stats.

(continued...)

3. Commission Determination

63. With regard to the effective date, we will grant waiver of the Commission's regulations to permit an effective date of more than 120 days from the date of MISO's filing. Consistent with MISO's commitment, we direct MISO to make a compliance filing due 120 days after the date of this order which includes a status report and the date when MISO proposes to implement the proposed new and revised Tariff provisions.⁹⁵ We leave for further order on that 120-day compliance filing, issues regarding the effective date of the Extended LMP methodology. We will further require MISO to: (1) complete three months or more of parallel testing, including parallel settlement statements, prior to implementing the Extended LMP methodology; and (2) provide an informational report to the Commission within 14 months of the implementation of the Extended LMP methodology that discusses the first 12 months of experience implementing the methodology, including any further revisions that MISO believes may be needed.⁹⁶

64. In its proposal, MISO discussed but did not commit to a parallel testing period in which it would run the market with both SCED and Extended LMP algorithms, stating that it is "currently planning" to conduct such parallel testing for a three-month period.⁹⁷ In its answer, MISO states that it remains committed to providing complete settlement statements during parallel testing, but conditions provision of those settlement statements upon its ability to provide the statements with existing software. Using the Extended LMP algorithm, MISO would develop both Extended LMP prices and Extended LMP Revenue Sufficiency Guarantee credits and cost allocations in demonstrating what the settlements would be under the Extended LMP algorithm. We believe that it is important for there to be parallel settlements prior to the move to the Extended LMP methodology. This parallel testing period will enable MISO and its market participants to better anticipate the changes that the Extended ELMP algorithm will bring to the market. It is important that MISO provide market participants with complete transparency into its methodology during the parallel testing period. Accordingly, we require MISO to execute parallel testing for a period of three months or more before implementing the

& Regs. ¶ 31,292 (2009), *order on reh'g*, Order No. 719-B, 129 FERC ¶ 61,252 (2009); *ISO New England, Inc., et al.*, 109 FERC ¶ 61,147, at P 58 n.46, P 64 (2004)).

⁹⁵ December 22 Filing at 13-14.

⁹⁶ We note that should MISO find that further revisions to the Tariff sheets conditionally accepted herein are needed, MISO would need to file a new section 205 filing to implement such changes.

⁹⁷ *Id.* at 7.

Extended LMP methodology. We also require MISO to provide complete parallel settlement statements during the parallel testing period, including detailed comparisons of market participant settlements under the SCED and Extended LMP algorithms.

65. We reject Midwest TDUs' request that the Commission reserve judgment on MISO's proposal until after the parallel testing period is completed. The parallel testing period is important for providing market participants with an opportunity to become familiar with the clearing prices calculated by the Extended LMP algorithm and to ensure that the Extended LMP methodology is working as intended. However, parallel testing will not be able to demonstrate the proposal's total effects on market efficiency or consumer welfare. During parallel testing, market participants will still bid and have settlement under the existing SCED algorithm. Only when Extended LMP is implemented, and settlements based on the Extended LMP algorithm are binding, will market participant bidding behavior fully adjust to the new methodology. As such, the market efficiency benefits that result from improved market signals under Extended LMP will not fully be realized until the methodology is implemented. In addition, improved market signals should provide both short term and long term benefits. These benefits cannot be expected to be fully seen over the testing period. We have already found that the Extended LMP methodology should create improved pricing signals that are just and reasonable, and do not find it appropriate to condition that finding on the results of a three-month testing period with non-binding settlements.

66. We will reject Ameren's request that MISO be ordered to file a status report on the performance of the Extended LMP program six months after its implementation. However, we will require MISO to file an informational report on the performance of the Extended LMP algorithm within 14 months after implementing the Extended LMP methodology.⁹⁸ We believe that the longer window for the study will allow a more complete view of the effects of MISO's proposal and any modifications that are needed to that program, as it will show any seasonal effects associated with the first year of implementation. The report should discuss effects of the Extended LMP algorithm on nodal prices, uplift charges, and the use of shortage prices. It should track market-wide charge component data from the Extended LMP methodology and existing SCED algorithm for the parallel testing period and for the first 12 months following implementation of the Extended LMP methodology, provide analytics associated with the Extended LMP methodology, and provide any recommendations of MISO and MISO's Independent Market Monitor with respect to whether the Extended LMP methodology should be further modified. We believe that it will be important for MISO to provide an

⁹⁸ This filing will be for informational purposes only. The Commission will not notice the filing, nor accept comment on it, and the filing will not require Commission action.

evaluation of potential enhancements to the methodology, especially since it has already indicated that it plans to study possible improvements with stakeholders after the implementation of the Extended LMP algorithm and other market changes (for instance, potentially expanding the definition of Fast Start Resources pending the implementation of certain look-ahead market mechanisms).

67. We will also reject AMP's request that MISO be required to provide additional information on a plan to revert to the existing SCED algorithm if MISO determines that it is more effective than the proposed Extended LMP methodology. As MISO notes, if a stakeholder objects to the price signals produced by Extended LMPs, it may file a complaint under section 206 of the FPA.

D. Make-Whole Credit Issues

68. We will conditionally accept MISO's proposal to make additional resources, including must-run resources, eligible to receive Day-Ahead Revenue Sufficiency Guarantee credits. As MISO explains, absent these credits, resources may not recover their as-offered costs under the Extended LMP proposal due to differences between the *ex ante* process that generates cleared schedules and the *ex post* process that defines clearing prices.⁹⁹ We note that MISO's existing Tariff does not permit resources that are not committed by MISO (e.g., must-run resources) to receive Day-Ahead Revenue Sufficiency Guarantee credits.¹⁰⁰ If resources that are not committed by MISO receive guaranteed recovery of all of their production and operating reserve costs via Day-Ahead Revenue Sufficiency Guarantee credits, these resources could have an incentive to inflate their offer costs in order to extract additional credits. While MISO proposes to limit must-run resources' eligibility for Day-Ahead Revenue Sufficiency Guarantee credits to include "the incremental cost and revenue for the MW above its achievable minimum for Energy and/or Self Schedule amounts for Reserves,"¹⁰¹ MISO does not address whether this limitation on cost recovery will prevent potential gaming of Day-Ahead Revenue Sufficiency Guarantee credits. We will require MISO to include in its compliance filing due 30 days after the date of this order an explanation of how the proposal addresses this issue and, if not, Tariff revisions to address any gaming risks.

69. We are concerned that MISO does not explain why each type of resource made eligible for Day-Ahead Revenue Sufficiency Guarantee credits does not also require Real-Time Revenue Sufficiency Guarantee credits (i.e., Real-Time Revenue Sufficiency

⁹⁹ December 22 Filing at 12.

¹⁰⁰ MISO, FERC Electric Tariff, § 39.3.2B (1.0.0).

¹⁰¹ Vannoy Test. at 8.

Guarantee credits, Day-Ahead Margin Assurance Payments, and Real-Time Offer Revenue Sufficiency Guarantee Payments). MISO maintains that modifications to these credits are unnecessary, stating that “[u]nder Real Time [Revenue Sufficiency Guarantee], the only price sensitive transactions are for Resources that provide an Offer Curve used as part of the SCED and [Extended LMP algorithms]. The current Tariff keeps such Resources whole for transactions settled in the Real Time Market.”¹⁰² We will require MISO to explain, in the compliance filing due 30 days after the date of this order why certain resources should be made eligible for day-ahead make-whole credits, but not for those in the Real-Time Market.

E. Overlaps with Other Filings

70. We also are concerned that, in several sections, MISO’s proposed Tariff revisions do not reflect revisions that were proposed in MISO’s August 19, 2011 Order No. 745 Compliance Filing.¹⁰³ In particular, contrary to the Tariff revisions contained in its August 19 Order No. 745 Compliance Filing, MISO proposes to: (1) reinsert language regarding the treatment of host load zones in sections 39.3.1, 39.3.2C.a, and 40.3.3.a; (2) modify references to the term “Demand Response Resources” in sections 39.3.2, 39.3.2B, 39.3.2C, and 40.3.3.c.ii-iii; (3) remove from section 39.3.2C revisions regarding day-ahead demand response resource compensation; (4) omit from section 40.3.3.a.ii(4) language regarding the determination of Real-Time Revenue Sufficiency Guarantee charges associated with deviations due to demand response resources; (5) remove from section 40.3.3.b.vi instances of “or” and “and” between the terms “Generation Resources” and “Demand Response Resources”; and (6) remove from sections 40.3.3.c.ii-iii revisions regarding real-time demand response resource compensation and excessive energy credits. MISO has not explained why these modifications are necessary to implement the Extended LMP methodology or are otherwise just and reasonable. Accordingly, we will require MISO to submit in the compliance filing due 30 days after the date of this order an explanation of why these revisions are necessary or Tariff revisions to reinsert the revisions that the Commission conditionally accepted in the Order No. 745 compliance proceeding.

71. We note that the proposed revisions to sections 40.3.3 and 40.3.4 do not reflect, and will supersede, all of the revisions that were filed in MISO’s March 14 Order

¹⁰² *Id.*

¹⁰³ MISO, Compliance Filing, Docket No. ER11-4337-000 (filed Aug. 19, 2011) (August 19 Order No. 745 Compliance Filing). The Commission conditionally accepted in part and rejected in part this compliance filing. *Midwest Indep. Transmission Sys. Operator, Inc.*, 137 FERC ¶ 61,212 (2011).

No. 719 Compliance Filing,¹⁰⁴ and in the March 14 Order No. 745 Compliance Filing.¹⁰⁵ MISO's proposed revisions in section 39.3.2C are not reflected in, and will be superseded by, MISO's March 14 Order No. 745 Compliance Filing.¹⁰⁶ As a result, if the Commission accepts sections 39.3.2C, 40.3.3, and 40.3.4 of the March 14 Order No. 719 Compliance Filing and/or March 14 Order No. 745 Compliance Filing, the latest version of MISO's Tariff may not reflect all of the revisions accepted by the Commission. In addition, in sections 39.3.2B, 39.3.2C, 40.3.3.b.vi, and 40.3.3.c.ii-iii, MISO proposes to remove language regarding the treatment of demand response resources and demand response that is facilitated by behind-the-meter generation. We note that MISO also proposed to remove this language in its March 14 Order No. 745 Compliance Filing.¹⁰⁷ Due to the overlaps among these proceedings, we will conditionally accept the proposed revisions to sections 39.3.2B, 39.3.2C, 40.3.3, and 40.3.4, subject to the outcome of the proceedings in Docket Nos. ER12-1265-000 and ER12-1266-000.

F. Miscellaneous

72. In addition, we will require MISO to make the following changes (or explain why they should not be made) in the compliance filing due 30 days after the date of this order:

- (1) In section 1.213, remove the second instance of the word "that;"

¹⁰⁴ MISO Compliance Filing, Docket No. ER12-1265-000 (filed Mar. 14, 2012) (March 14 Order No. 719 Compliance Filing); MISO, FERC Electric Tariff, [40.3.3, Real-Time Energy and Operating Reserve Market Settlement Cal, 2.4.0](#), at § 40.3.3.c.iv, [40.3.4, Charge for Excessive/Deficient Energy and Reserve Deployment, 4.4.0](#), at §§ 40.3.4.a.vii, 40.3.4.g.i-ii.

¹⁰⁵ MISO Compliance Filing, Docket No. ER12-1266-000 (filed Mar. 14, 2012) (March 14 Order No. 745 Compliance Filing); MISO, FERC Electric Tariff, [40.3.3, Real-Time Energy and Operating Reserve Market Settlement Cal, 2.5.0](#), at §§ 40.3.3.a.iii(4), 40.3.3.a.vii(4), 40.3.3.a.xvii, 40.3.3.c.ii-iii, [40.3.4, Charge for Excessive/Deficient Energy and Reserve Deployment, 4.5.0](#), at 40.3.4.a.xii-xiii, 40.3.4.g.i-ii.

¹⁰⁶ *Id.*, [39.3.2C, Charges and Payments for Purchases and Sales for DRRs, 4.0.0](#), at § 39.3.2C.b.

¹⁰⁷ *Id.*, [39.3.2B, Day-Ahead Revenue Sufficiency Guarantee Payments, 1.5.0](#), [39.3.2C, Charges and Payments for Purchases and Sales for DRRs, 4.0.0](#), [40.3.3, Real-Time Energy and Operating Reserve Market Settlement Cal, 2.5.0](#), at §§ 40.3.3.b.vi, 40.3.3.c.ii-iii.

- (2) In section 1.366, clarify in the definition of “Locational Marginal Price” that such prices may be either “Ex Ante” or “Ex Post;”
- (3) In section 1.379, clarify in the definition of Market Clearing Price that such prices may be either “Ex Ante” or “Ex Post;”
- (4) In section 1.533c, clarify that the “Real-Time Ex Ante LMP” is associated with a specific location;
- (5) In section 1.533d, clarify that the “Real-Time Ex Ante MCP” is associated with a specific location;
- (6) In sections 32.2.9.d-h, qualify “LMP” in the text such that it reads “relevant LMP” or “respective LMP;”
- (7) In section 40.3.3.a.iii, reinsert the numbering for section “iii;”
and
- (8) In section 1.535, correct the following errors in blackline:

The real-time make-whole payment provided under Section 40.3.5 of this Tariff to the Resources described therein, when the sum of revenue from Hourly Real-Time Ex Post LMPs and Hourly Real-Time ExPost MCPs does not fully cover the incremental Energy Offer costs and Operating Reserve Costs of such Resources.

- (9) Within sections II and III of Schedule 29A, for clarity, include appropriate sub-headings indicating the type of resource and its commitment status that is being discussed to aid in the identification of what costs the Extended LMP algorithm will consider.¹⁰⁸
73. We will also require MISO to explain:
- (1) In section 40.2.17, why it added “on a real-time basis” to various sections, including h, j, k, m;

¹⁰⁸ For example, in section II MISO should include the subheadings such as “Committed in the Day-Ahead Market,” and “Committed in the Day-Ahead Market to provide Regulating Reserves,” “Committed in the Day-Ahead Market to provide Regulating Reserves,” and “Off-line, Available for Commitment,” as well as a section heading relating to the Day Ahead Objective Function, in the appropriate locations.

(2) In Schedules 5 and 6, why it replaced MCP with “Hourly Real-Time Ex Post MCP” in several places, given that in the introductions to these Schedules, MISO discusses acquiring reserves in both the real-time and day-ahead markets; and

(3) In Schedule 29A, why the discussion of constraints in the objective function for the day-ahead market includes the phrase “cleared by SCED pricing” except when discussing: (1) the “Market-Wide Regulating and Spinning Reserve Constraint”; and (2) the Reserve Zone Regulating and Spinning Reserve Constraints.”

The Commission orders:

(A) MISO’s proposed Tariff revisions are hereby conditionally accepted, as discussed in the body of this order subject to compliance filings due 30 and 120 days after the date of this order, as discussed in the body of this order, and the outcome of the proceedings in Docket Nos. ER12-1265-000 and ER12-1266-000.

(B) MISO is hereby directed to submit compliance filings due 30 days and 120 days after the date of this order, as discussed in the body of this order.

(C) MISO is directed to submit an informational report addressing the performance of the Extended LMP algorithm within 14 months after the implementation of the methodology.

By the Commission. Commissioner Clark is not participating.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.