167 FERC ¶ 61,217
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Neil Chatterjee, Chairman;
Cheryl A. LaFleur, Richard Glick,
and Bernard L. McNamee.

Southwest Power Pool, Inc. Docket No. EL18-35-000

ORDER ON PAPER HEARING

(Issued June 12, 2019)

1. On December 21, 2017, pursuant to section 206 of the Federal Power Act (FPA),[1] the Commission instituted an investigation to examine Southwest Power Pool, Inc.'s (SPP) practices regarding the pricing of quick-start resources[2] and whether SPP should be required to revise its Open Access Transmission Tariff (Tariff).[3] In the December 2017 Order, the Commission found that SPP's quick-start pricing practices may be unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load, and the Commission identified changes to SPP's Tariff that, upon initial review, would result in rates that are just and reasonable.[4] In this order, we direct SPP to revise its Tariff to implement the changes identified in the December 2017 Order, as discussed further below.

[1] 16 U.S.C. § 824e (2012).

[2] SPP refers to resources that are able to start up within ten minutes or less and choose to register with SPP for inclusion in its quick-start logic as quick-start resources. SPP, OATT, Sixth Revised Volume No. 1, Attachment AE, § 1.1 Q (0.0.0). Resources that are able to start quickly to address system needs have different names in other regional transmission organizations (RTOs) and independent system operators (ISOs), and the Commission has generically referred to such resources as fast-start resources.

[3] *Sw. Power Pool, Inc.*, 161 FERC ¶ 61,296 (2017) (December 2017 Order).

[4] *Id.* PP 1, 25.

I. Background

2. Fast-start resources are resources that are able to start quickly to meet system needs of an RTO/ISO, but are often dispatched to their inflexible economic minimum or maximum operating limits, and thus are not eligible to set prices absent special pricing logic, such as fast-start pricing.[5] Fast-start pricing allows an RTO's/ISO's software algorithms to incorporate the offers of fast-start resources into the market prices for energy and ancillary services, typically by treating fast-start resources as flexible (i.e., fully dispatchable from zero to their economic maximum operating limits) during a pricing run that is performed separately from the dispatch run. Additionally, fast-start pricing allows a fast-start resource to include its commitment costs (i.e., its start-up and no-load costs) in prices, thereby allowing a fast-start resource to recover a portion of its commitment costs through the market rather than through out-of-market uplift payments.

3. The Commission began pursuing reforms related to fast-start pricing as part of its broader price formation initiative.[6] On December 15, 2016, the Commission issued a notice of proposed rulemaking (NOPR) that preliminarily found that some existing RTO/ISO fast-start pricing practices, or lack of fast-start pricing practices, may not result in rates that are just and reasonable.[7] As a result, the Commission proposed establishing several requirements regarding the pricing of fast-start resources and sought comment on

[5] Many fast-start resources have limited or no dispatch range because their economic minimum operating limits are equal to (or are relatively close to) their economic maximum operating limits. A resource that is operating inflexibly at its economic minimum operating limit or economic maximum operating limit is not dispatchable to serve an additional increment or decrement of load, and thus is not eligible to set the locational marginal price (LMP) unless fast-start pricing logic is applied.

[6] The Commission initiated the price formation proceeding in June 2014 in Docket No. AD14-14-000. *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, Notice, Docket No. AD14-14-000 (June 19, 2014). During the initial stages of the price formation proceeding, the Commission held a series of public workshops, received comments, and directed the RTOs/ISOs to file reports on several price formation topics, including fast-start pricing. *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, 153 FERC ¶ 61,221, at P 1 (2015).

[7] *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 157 FERC ¶ 61, 213, at PP 3, 36-37 (2016) (NOPR).

those proposed requirements and the need for reform discussed in the NOPR.[8] Based on comments received, the Commission withdrew the NOPR, stating that while it continued to believe that improved fast-start pricing practices have the potential to achieve the goals outlined in the NOPR, it was persuaded to not require a uniform set of fast-start pricing requirements that would apply to all RTOs/ISOs.[9] Instead, the Commission initiated targeted section 206 investigations focusing on specific concerns with the fast-start pricing practices in New York Independent System Operator, Inc. (NYISO), PJM Interconnection, L.L.C. (PJM), and SPP.[10]

4. SPP currently has a set of practices in its real-time balancing market that apply to quick-start resources. SPP does not perform separate pricing and dispatch runs, but instead has a single unified pricing and dispatch run that is preceded by a separate screening run, also referred to as a feasibility assessment. The screening run is used to identify a set of resources to be excluded from the unified pricing and dispatch run. During the screening run, any resources that would be dispatched below their economic minimum operating limits are screened out (i.e., treated as off and excluded from consideration) during the subsequent unified pricing and dispatch run. This means that the supply from quick-start resources may not necessarily be considered in the unified pricing and dispatch run.[11]

5. Additionally, SPP gives registered quick-start resources an option to include commitment costs as part of the incremental cost curve that is used in both the screening run and the unified pricing and dispatch run. SPP does not have any minimum run time requirement for eligibility as a quick-start resource.

II. December 2017 Order

6. In the December 2017 Order, the Commission preliminarily found that the following SPP practices related to the pricing of quick-start resources are unjust and unreasonable: (A) having an approach to committing quick-start resources that may be inconsistent with minimizing production costs; (B) not allowing the commitment costs of

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[8] *Id.* PP 3, 44.

[9] *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 161 FERC ¶ 61,293 (2017).

[10] *N.Y. Indep. Sys. Operator, Inc.*, 161 FERC ¶ 61,294 (2017); *PJM Interconnection, L.L.C.*, 161 FERC ¶ 61,295 (2017); December 2017 Order, 161 FERC ¶ 61,296.

[11] *See* SPP Initial Brief at 10 & n.22.

quick-start resources to be reflected in prices; (C) not requiring quick-start resources to have a minimum run time; (D) precluding quick-start resources from setting prices when they are block-loaded or otherwise dispatched at their economic minimum operating limits; and (E) not including unregistered quick-start resources in quick-start pricing.[12]

7. Additionally, the Commission stated that, upon initial review, it believed that implementing the following changes to SPP's Tariff would result in rates that are just and reasonable:

> A) Commit and dispatch quick-start resources in real-time consistent with minimizing production costs, subject to appropriate operational and reliability constraints; and remove the option for enhanced energy offers for quick-start resources that incorporate commitment costs in the incremental energy curve;
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> B) Modify pricing logic to allow the commitment costs of quick-start resources (including all such resources even if they have not registered as quick-start resources) to be reflected in prices;
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> C) Include in the definition of quick-start resources a requirement that those resources have a minimum run time of one hour or less;
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> D) Allow for relaxation of all quick-start resources' economic minimum operating limits by up to 100 percent, such that the resources are considered dispatchable from zero to their economic maximum operating limit for the purposes of setting prices;
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> E) Consider both registered and unregistered quick-start resources in quick-start pricing to ensure prices reflect the cost of the marginal resource; and
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> F) Set forth in the tariff its rules and practices regarding the pricing of quick-start resources.[13]

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[12] December 2017 Order, 161 FERC ¶ 61,296 at P 6.

[13] *Id.* P 25.

8. The Commission explained that it expected the proposed changes would remedy SPP's current quick-start pricing practices that the Commission preliminarily found lead to unjust and unreasonable rates. For instance, the Commission stated that it expected the changes would more accurately reflect the marginal cost of serving load in periods when dispatching a quick-start resource is the next action taken to meet load; provide price signals that better inform investment decisions; and provide more accurate and transparent price signals that better reflect the cost of serving load, minimize production costs, and reduce uplift.[14]

III. Notice of Paper Hearing and Briefs

9. Notice of the institution of the section 206 proceeding in Docket No. EL18-35-000 was published in the Federal Register, 82 Fed. Reg. 61,565 (2017), on December 28, 2017. Pursuant to the December 2017 Order, interventions were due on or before January 11, 2018, initial briefs were due on or before February 12, 2018, and reply briefs were due on or before March 14, 2018.[15]

10. Entities listed in the Appendix filed notices of intervention or motions to intervene. Timely initial briefs were filed by Basin Electric Power Cooperative (Basin Electric); Department of Market Monitoring for the California Independent System Operator Corporation (CAISO Market Monitor);[16] Electric Power Supply Association and Independent Power Producers of New York (EPSA/IPPNY); Golden Spread Electric Cooperative, Inc. (Golden Spread); Oklahoma Gas & Electric Company (Oklahoma Gas & Electric); Southwest Power Pool Market Monitoring Unit (SPP Market Monitor); and Sunflower Electric Power Corporation and Mid-Kansas Electric Company, Inc. (Sunflower/Mid-Kansas). SPP and Westar Energy, Inc. (Westar) filed initial briefs out-of-time. Timely reply briefs were filed by Golden Spread; Kansas City Power & Light Company, KCP&L Greater Missouri Operations Company, and Westar (KCP&L/Westar); SPP; and the SPP Market Monitor.

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[14] *Id.*

[15] *Id.* P 28.

[16] Entities seeking to become a party to a proceeding must file a motion to intervene. 18 C.F.R. § 385.214(a)(3) (2018). Because the CAISO Market Monitor did not file a motion to intervene, it is not a party to this proceeding.

IV. Discussion

A. Procedural Issues

11. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2018), 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) (2018), we grant the late-filed motions to intervene given the entities' interest in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay.

B. Substantive Issues

12. Consistent with the preliminary findings in the December 2017 Order, we find that SPP's quick-start pricing practices are unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load. We direct SPP to make the following changes to its Tariff, which we find will result in rates that are just and reasonable:

A) Modify its real-time energy market clearing process to execute the cost-minimizing dispatch solution followed by a pricing run, remove its screening run, and remove the option for enhanced energy offers that incorporate amortized commitment costs in the incremental cost curves of quick-start resources used during the dispatch run;

B) Modify its pricing logic to allow the commitment costs of quick-start resources (including all such resources even if they have not registered as quick-start resources) to be reflected in prices, in both the day-ahead and real-time markets;

C) Include in the definition of quick-start resources a requirement that those resources have a minimum run time of one hour or less;

D) Allow for relaxation of all quick-start resources' economic minimum operating limits by up to 100 percent, such that the resources are considered dispatchable from zero to their economic maximum operating limit for the purpose of setting prices;

E) Apply quick-start pricing treatment to both registered and unregistered quick-start resources; and

F) Include its quick-start pricing practices in its Tariff.

13. We direct SPP to submit a compliance filing by December 31, 2019 with proposed tariff changes reflecting the above requirements and the proposed effective date.

1. Fast-Start Pricing

a. December 2017 Order

14. In the December 2017 Order, the Commission found that SPP's practices may not reflect the marginal cost of serving load when a quick-start resource is needed to quickly respond to unforeseen system needs, which may result in inaccurate price signals. The Commission identified modifications that are intended to more accurately reflect the marginal cost of serving load in periods when a quick-start resource is the marginal resource and provide price signals that better inform investment decisions, including where and when quick-start resources should be built or maintained.[17]

b. Initial Briefs

15. EPSA/IPPNY and Golden Spread generally support implementation of quick-start pricing reforms in SPP.[18] EPSA/IPPNY encourage the Commission to act expeditiously on quick-start pricing in SPP.[19] Golden Spread argues that, although it may be difficult to implement appropriate quick-start pricing, the Commission should not back away from its efforts to remedy market design infirmities.[20]

16. SPP, the SPP Market Monitor, the CAISO Market Monitor, Oklahoma Gas & Electric, and Sunflower/Mid-Kansas generally oppose the Commission's proposed modifications to SPP's quick-start pricing practices.

17. SPP states that the quick-start pricing changes identified in the December 2017 Order would require SPP to depart from its current unified pricing and dispatch run, which SPP refers to as ex-ante pricing, and instead implement separate pricing and dispatch runs, which SPP refers to as ex-post pricing. SPP states that its current approach maintains a link between resource availability and the determination of the marginal cost of the next increment of demand supplied from resources receiving physical dispatch instructions.[21] SPP states that it would prefer to implement quick-start pricing reforms using its current ex-ante pricing system due to transparency (i.e., consistency between

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[17] December 2017 Order, 161 FERC ¶ 61,296 at PP 1, 15, 18, 22, 23, 25.

[18] EPSA/IPPNY Initial Brief at 2; Golden Spread Initial Brief at 2.

[19] EPSA/IPPNY Initial Brief at 4-6.

[20] Golden Spread Reply Brief at 3.

[21] SPP Initial Brief at 9-10.

pricing and dispatch decisions), the cost and complexity of implementing ex-post pricing, and potential unintended consequences. SPP further states that it has serious concerns about separating pricing and dispatch decisions (i.e., ex-post pricing). SPP asserts that, under its current ex-ante approach, prices are based on marginal cost philosophy where resources set price by the next marginal increment of energy and resources are capable of setting price when they are capable of performing. SPP cautions that ex-post pricing may have unintended consequences when resources that are incapable of providing a discrete marginal increment are permitted to set price—for example, LMP could be set below the offer of a resource instructed to perform. SPP also expresses concerns about price-chasing and potential withdrawal of resources from reliability products.[22]

18. SPP provides several hypothetical scenarios in which a quick-start resource could end up setting price following an unplanned generator de-rate and create potential pricing issues. Using its interpretation of the Commission's proposed quick-start pricing requirements, SPP notes that load may pay more than generation receives (even absent congestion and losses), leading to the hypothetical de-rated resource receiving more revenue using quick-start pricing than it would have if it had not been de-rated, despite experiencing a lower production and a lower production cost. SPP further observes that this phenomenon could occur even if the quick-start resource is not actually dispatched, and could be magnified if the resource is permitted to set prices on a regional rather than locational basis. SPP also states that quick-start pricing will result in an additional revenue stream which will be returned *pro-rata* to load and generation.[23]

19. The SPP Market Monitor agrees that SPP's current quick-start logic should be improved.[24] However, the SPP Market Monitor argues that the Commission's proposed changes in the December 2017 Order will result in a move away from marginal cost pricing and will effectively implement average cost pricing. The SPP Market Monitor states that SPP's current approach appropriately reflects operational and reliability constraints by using only the physical offer parameters that are deliverable or feasible at dispatch.[25] The SPP Market Monitor states that only flexible resources that are dispatchable to serve the next increment or decrement of load should be allowed to set price.[26] The SPP Market Monitor maintains that SPP's unified pricing and dispatch run

[22] *Id.* at 9, 11-12.

[23] *Id.* at 15-19.

[24] SPP Market Monitor Initial Brief at 9.

[25] *Id.* at 10.

[26] *Id.* at 13.

achieves optimal pricing and dispatch solutions that respect the physical parameters of resources, and that pricing and dispatch must operate under the same principles. The SPP Market Monitor states that any non-convexities in the optimization process can be dealt with through uplift payments,[27] and that ignoring parameters in the optimization process would create inefficiencies by rewarding inflexible resources for fictional flexibility (for example, several smaller resources could combine to create a larger resource that would set a favorable price for itself).[28] The SPP Market Monitor states that the SPP market has only two block-loaded resources, and therefore the changes identified in the December 2017 Order would have a de minimis effect. The SPP Market Monitor states that the December 2017 Order's requirements would create incentives for resources to provide less actual flexibility to the market, which could potentially increase the number of block-loaded resources. The SPP Market Monitor states that, because another resource must be backed down to accommodate a quick-start resource, yet would still get paid as if it were producing the original amount, the Commission's proposed changes would increase production costs, which is in conflict with the objective of the December 2017 Order.[29]

20. The SPP Market Monitor further states that implementing separate pricing and dispatch runs (i.e., ex-post pricing) would require a major overhaul of SPP's market clearing software and possibly its hardware.[30] The SPP Market Monitor maintains that any new quick-start pricing changes would likely crowd out other market design initiatives that should take priority over quick-start pricing, including the development of a ramping product, decommit logic, multi-day unit commitment logic, and stored energy rules.[31]

21. Oklahoma Gas & Electric states that the facts discussed in the December 2017 Order do not support a finding that SPP's unified pricing and dispatch run is unjust and unreasonable. Oklahoma Gas & Electric asserts that SPP's unified pricing and dispatch run is fundamental to SPP's market design and that redesigning it would affect all resources and load in SPP. Oklahoma Gas & Electric argues that separating pricing and dispatch will require substantial software and computer system changes, take years to implement, and would result in significant costs. Oklahoma Gas & Electric states that before making such changes, SPP and its stakeholders should have the opportunity to

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[27] *Id.* at 16.

[28] *Id.* at 18.

[29] *Id.* at 18-19.

[30] *Id.* at 23.

[31] *Id.* at 27-30.

evaluate the consequences.[32] Sunflower/Mid-Kansas argue that the Commission must consider the point at which the cost of the optimally accurate and cost-effective dispatch renders the proposed changes unjust and unreasonable.[33]

22. Basin Electric argues that, to the extent the Commission requires SPP to reflect quick-start resources' commitment costs in prices, the Commission should specifically define locally and frequently constrained areas and provide a mechanism for identifying such areas and ensuring resources in such areas do not set the marginal energy component of LMP.[34] The CAISO Market Monitor argues that prices determined from a market with separate scheduling and pricing runs, or those which include commitment costs in the determination of per-unit power prices, would not reflect actual marginal tradeoffs, and these prices would not give producers and consumers the incentive to follow the efficient dispatch.[35]

c. Reply Briefs

23. SPP argues that the record in this proceeding does not establish either that SPP's existing quick-start pricing logic is unjust and unreasonable or that the changes identified in the December 2017 Order are just and reasonable. SPP argues that there is insufficient evidence that separating its unified pricing and dispatch runs will produce benefits commensurate with the substantial costs and administrative burdens associated with implementing the changes. SPP states that the changes are fundamental in nature and will require considerable staffing, software, and other expenses, as well as a significant amount of time to complete.[36]

24. The SPP Market Monitor argues that the changes identified in the December 2017 Order run counter to marginal pricing methodology and would not result in just and reasonable rates. In particular, the SPP Market Monitor states that commitment costs should not be included in prices because that is inconsistent with economic theory and marginal cost pricing, while block-loaded resources should not set LMP because that is

[32] Oklahoma Gas & Electric Initial Brief at 5-6.

[33] Sunflower/Mid-Kansas Initial Brief at 7-8.

[34] Basin Electric Initial Brief at 7-8.

[35] CAISO Market Monitor Initial Brief at 5-6.

[36] SPP Reply Brief at 4-5.

also inconsistent with marginal cost pricing.[37] The SPP Market Monitor argues against the adoption of an ex-post pricing system, which it asserts would hide true prices until after transactions have taken place, resulting in decreased transparency and inaccurate price signals for suppliers and consumers. The SPP Market Monitor states that separating pricing and quantity decisions sends the wrong price signals. The SPP Market Monitor states that introducing a new pricing scheme would amount to an overhaul of SPP's existing ex-ante pricing mechanism, which would require SPP and its stakeholders to take significant time and effort to implement.[38]

25. Golden Spread supports the changes proposed in the December 2017 Order. Golden Spread states that, while it appreciates the technical complexity of what is being proposed, that does not mean that it is unachievable or unjustified.[39] Golden Spread states that a possible alternative approach would leverage SPP's existing design and maintain the inclusion of start-up and no-load costs in the quick-start resource offer curve. Golden Spread explains that such an approach would require software logic to adjust the pricing design to allow the security constrained economic dispatch (SCED), on an ex-ante basis, to include a quick-start resource's commitment costs in the LMP. Golden Spread stresses that this approach presumes that the LMP is transparent and inclusive, and that quick-start resources will never be committed via reliability unit commitments or manual commitments.[40]

26. KCP&L/Westar assert that SPP should be required to allow marginal unregistered quick-start resources to set prices even when the amount of energy is below the resource's economic minimum operating limit, but argue that this change should be implemented under SPP's current ex-ante pricing method. KCP&L/Westar contend that ex-post pricing may make sense in isolation, but the administrative costs of the fundamental system redesign required to implement ex-post pricing have not been shown to be cost effective.[41]

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[37] SPP Market Monitor Reply Brief at 1-2.

[38] *Id.* at 5-6.

[39] Golden Spread Reply Brief at 2-3.

[40] *Id.* at 4-6.

[41] KCP&L/Westar Reply Brief at 2-4.

d. Determination

27. In the December 2017 Order, the Commission found that SPP's existing quick-start pricing practices may be unjust and unreasonable because they fail to reflect the marginal cost of serving load, and that adopting the proposed changes identified in that order would lead to prices that more accurately reflect the marginal cost of serving load.[42] We continue to find that SPP's existing quick-start pricing practices are unjust and unreasonable because they fail to reflect the marginal cost of serving load and that implementing the reforms directed herein will result in prices that more accurately reflect the marginal cost of serving load. We continue to find that, because of their operating characteristics, quick-start resources are uniquely situated to respond to unforeseen or transient real-time system needs that are short-term in nature. When quick-start resources are committed in real-time, it is often at short notice to meet some system condition or market need over a short time period. Specifically, expanding the conditions in which quick-start resources are allowed to participate in setting prices by relaxing the economic minimum operating limit and incorporating commitment costs of quick-start resources in prices more accurately represents the marginal cost of serving load, which will better reflect system needs, and help inform investment decisions. For these reasons, we continue to find that commitment costs of quick-start resources should be considered marginal for the purpose of setting prices in SPP. The Commission made these findings on a preliminary basis in the December 2017 Order, and as discussed below, we continue to support these findings after careful consideration of commenters' arguments.

28. In particular, we find that commitment costs for quick-start resources are marginal because they are generally incurred in coordination with the real-time dispatch. We find that long lead-time resources, in contrast to quick-start resources, have some flexibility in real time to increase or decrease production, but that such adjustments are unrelated to the resources' commitment costs and that the commitment costs of long lead-time resources should not be considered in the determination of real-time prices. When quick-start resources are deployed economically in real-time, it is often at short notice to meet some unforeseen or transient system condition or market need over a short time period. As such, we find that the commitment costs for such resources should be considered marginal costs and included in real-time prices.

29. While SPP, the SPP Market Monitor, Oklahoma Gas & Electric and the CAISO Market Monitor object to quick-start pricing in general, the Commission has already determined that quick-start pricing reflects the marginal cost of serving load and can result in rates that are just and reasonable.[43] Further, our investigation in this proceeding

[42] December 2017 Order, 161 FERC ¶ 61,296 at PP 1, 25.

[43] *N.Y. Indep. Sys. Operator, Inc.*, 95 FERC ¶ 61,121, at 61,379 (2001); *Midwest Indep. Transmission Sys. Operator, Inc.*, 140 FERC ¶ 61,067, at PP 37-38 (2012).

seeks to remedy certain issues with SPP's existing implementation of quick-start pricing. We note that SPP currently applies special pricing logic to quick-start resources, and the changes required in this order will not require SPP to depart from marginal cost pricing. We disagree with objections from SPP, the SPP Market Monitor, and the CAISO Market Monitor that quick-start pricing departs from marginal cost pricing. After considering their arguments, we continue to find that the cost of a decision to start a quick-start resource in real time, typically on short notice to meet some unforeseen or transient system need, represents a marginal cost that should be reflected in prices. Finally we disagree with Basin Electric that quick-start pricing should be conducted on a locational basis within the Marginal Congestion Cost LMP component, and not in the market-wide components. As noted above, quick-start pricing does not diverge from the principles used in development of LMPs, where the marginal resource can affect the price at every node in the network. Quick-start pricing is consistent with the principles used in the development of market-wide clearing prices, because the commitment of the quick-start resource represents the marginal action taken, and thus more accurately reflects the marginal cost of serving load.

30. For several reasons, we disagree with the SPP Market Monitor's characterization of the consequences of separate pricing and dispatch runs (i.e., ex-post pricing). First, if properly implemented, a dispatch run separate from a pricing run does not ignore resources' physical parameters. On the contrary, as discussed below in section IV.B.2.c, SPP's unified pricing and dispatch run ignores some resources' physical parameters, and the directives herein seek to, among other things, address such problems. Second, we disagree with the SPP Market Monitor's contention that a separate pricing run could raise production costs. Production costs are solely determined by the dispatch run, and are unchanged by a separate pricing run. Separating pricing and dispatch enables the resources that reflect the cost of serving the next increment of load to set prices, which in this case results in more accurate pricing. In the long-term, more accurate prices that should result from quick-start pricing will better inform investment decisions and increase overall market surplus. Third, we also disagree with the SPP Market Monitor that separate pricing and dispatch runs will decrease transparency. We expect prices will be more transparent because the costs of resources needed to serve load will be better reflected in prices, rather than through out-of-market payments such as uplift, the details of which are invisible to most market participants. Fourth and finally, with regard to SPP's concern that LMP could be set below the offer of a resource instructed to perform, this is no different than under traditional LMP/uplift pricing[44] when a resource is

[44] By "traditional LMP/uplift pricing," we refer to a set of pricing rules that computes energy market prices based only on incremental energy cost offers and compensates resources for commitment costs in excess of price-based revenues through direct payments such as uplift payments.

dispatched at its economic minimum operating limit because in that scenario the resource cannot set price and by definition the LMP is set by another less expensive resource.

31. SPP provided several hypothetical scenarios in which, under quick-start pricing, a resource may receive more revenue when it is de-rated than it receives when operating at its full capability, even though its production costs are lower when de-rated.[45] We disagree that these examples are consistent with the quick-start pricing changes directed in this order. The directives modify offers, not prices, and the usual principles of marginal cost price formation apply. Therefore, the difference in revenue between what load pays and what resources receive represents congestion rents as before, and therefore the directives in this order would not produce a distinct over-collection of payments to be redistributed, as described by SPP. Under quick-start pricing some prices will rise, and it is possible that under a partial forced outage a resource could receive more revenue than if it was following its original schedule. However, the directives in this order help to accurately represent the marginal cost of serving load, irrespective of the circumstances leading to quick-start resources setting price. And in the absence of market power the ability of a single resource to raise prices through a forced outage is limited, and is not unique to quick-start pricing. Additionally, SPP's examples are inconsistent with the tariff revisions required herein given that offline resources not committed in the dispatch run are not considered in setting prices. Therefore, we do not find SPP's examples sufficiently compelling relative to the benefits of improving price formation using quick-start pricing.

32. We disagree with the SPP Market Monitor's arguments that quick-start pricing will result in an incentive for quick-start resources to reduce the flexibility they offer into the market. We note that if a resource chooses to make itself look less flexible, this would decrease the likelihood of it being economically dispatched and may ultimately lower its revenues over the long-run.

33. Additionally, we find that the advantages of traditional LMP/uplift pricing, as compared with quick-start pricing, are not as stark in practice as some commenters have argued. In particular, while traditional LMP/uplift pricing incentivizes market participants to follow dispatch instructions, other mechanisms can also be employed to incentivize following dispatch.[46] As discussed in section IV.B.8 below, we encourage

[45] SPP Initial Brief at 15-19.

[46] *See* December 2017 Order, 161 FERC ¶ 61,296 at P 26 (listing deviation penalties, settling over-generated MWh at standard LMP, and lost opportunity cost payments as potential mechanisms for incentivizing resources to follow dispatch instructions).

SPP to develop any necessary changes to ensure that market participants have appropriate incentives to follow SPP's dispatch instructions.

34. We acknowledge that the quick-start pricing changes discussed in this order will require SPP to develop and implement separate pricing and dispatch runs which results in prices that are modified after-the-fact through the use of additional data and are not identical to those found in the dispatch decision (i.e., ex-post pricing). SPP, the SPP Market Monitor, and Oklahoma Gas & Electric have expressed concerns about the complexity in establishing a distinct dispatch run with additional model execution to establish ex-post pricing. We note that the software for implementing separate pricing and dispatch runs already exists and has been implemented in multiple other markets, including Midcontinent Independent System Operator, Inc. (MISO), ISO New England Inc. (ISO-NE), and New York Independent System Operator, Inc. (NYISO).[47] We also expect that the benefits of more accurate energy market pricing that results from allowing quick-start resources to participate in setting prices and incorporating commitment costs of quick-start in prices, along with the concomitant increase in efficiency while properly optimizing SPP's resources, will be considerable, especially over time.

35. With regard to the SPP Market Monitor's argument that there are few block-loaded resources in SPP, we note that the quick-start pricing changes required in this order are not limited to block-loaded resources.

2. Approach to Committing Quick-Start Resources

a. December 2017 Order

36. In the December 2017 Order, the Commission preliminarily found that SPP's approach to committing and dispatching quick-start resources may be inconsistent with the objective of minimizing system production costs. The Commission stated that an efficient dispatch can only be reliably determined by modeling the actual system costs and actual system constraints within a market run that minimizes production costs. The Commission stated that SPP will "screen out" quick-start resources that would be dispatched below their economic minimum operating limits in the screening run so that they are not considered available for dispatch in the following unified pricing and dispatch run, which results in dispatch schedules that do not accurately reflect actual available resources. Additionally, the Commission stated that the screening run may inappropriately assume some quick-start resources are offline when they are physically

[47] MISO, FERC Electric Tariff, Schedule 29A, ELMP for Energy and Operating Reserve Market: Ex-Post Pricing Formulations (55.0.0); ISO-NE, Transmission, Markets and Services Tariff, Market Rule 1, § III.2.4 (33.0.0); NYISO, Market Administration and Control Services Tariff, Attachment B, § 17.1 (23.0.0).

incapable of turning off, which may cause system power imbalances that need to be managed through frequency regulation resources. The Commission also stated that SPP includes commitment costs in the process for determining dispatch instructions, which may lead to inefficient dispatch that is inconsistent with the least-cost solution, and the resulting dispatch may fail to accurately reflect optimal energy production of quick-start resources.[48]

37. The Commission concluded that, upon initial review, SPP could remedy this practice that potentially leads to unjust and unreasonable rates by committing and dispatching quick-start resources in real-time consistent with minimizing production costs, subject to appropriate operational and reliability constraints, and removing the option for enhanced energy offers for quick-start resources that incorporate commitment costs in the incremental energy curves used in the process for determining dispatch instructions.[49]

b. Initial and Reply Briefs

38. SPP asserts that its current commitment and dispatch process acknowledges physical limitations of dispatch while ignoring a quick-start resource's economic minimum operating limits for pricing purposes.[50] SPP explains that the screening run identifies quick-start resources that are not cost-effective and have operating parameters that cannot be honored, and then removes those quick-start resources from the unified pricing and dispatch run. SPP asserts that failure to honor resources' physical limitations in the pricing and dispatch process can result in power imbalances that must be managed through regulation resources. Additionally, SPP contends that committing a quick-start resource when it is not cost effective or when its operating parameters cannot be honored would be discriminatory against other resources being committed in the market.[51]

39. Golden Spread notes that under SPP's current practices, quick-start resources are screened out and considered unavailable for dispatch, and therefore the unified pricing and dispatch run does not reflect operating reality. Golden Spread adds that this results in inefficient dispatch and imbalances. Golden Spread notes that it has always had concerns, which it expressed in other proceedings, that the "backbone" of the current SPP model is not focused on transparent pricing of actual services provided through the LMP,

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[48] December 2017 Order, 161 FERC ¶ 61,296 at PP 11-14.

[49] *Id.* P 25.

[50] SPP Initial Brief at 20.

[51] *Id.* at 20-21.

and instead on the concept of reliability unit commitments or manual commitments.[52] Golden Spread notes that quick-start resources should not be committed through these processes, and given that they are effectively online at zero, the need for reliability unit commitments should largely be eliminated for quick-start resources.[53]

40. The SPP Market Monitor states that SPP's screening run and subsequent unified pricing and dispatch run respect the physical parameters of resources while minimizing production cost. The SPP Market Monitor argues that the purpose of the screening run is to ensure that quick-start resources are not dispatched below their minimum limits.[54]

41. Golden Spread agrees with the Commission that commitment costs should be removed from the energy offer curve and incorporated into the price formation logic in SPP's security-constrained economic dispatch, in both the day-ahead and real-time markets.[55] The SPP Market Monitor also agrees that SPP market rules should remove the option for incorporating commitment costs in the incremental energy offer curve.[56]

42. Basin Electric argues that the Commission is correct in asserting that SPP's current approach to committing and dispatching quick-start resources in real-time may be inconsistent with the objective of minimizing system production costs, but argues that eliminating the screening run may result in over-generation and misleading economic signals, as well as incentivizing the dispatch of block-loaded resources.[57]

c. Determination

43. We find that SPP's current approach to considering quick-start resources and their commitment costs when determining real-time dispatch is unjust and unreasonable because it is inconsistent with the objective of minimizing system costs, may create risks to system reliability, and may unnecessarily increase the cost of serving load.

44. First, SPP's screening-out of quick-start resources increases production costs by unnecessarily restricting the set of resources that can be used to meet unforeseen or transient real-time system needs. Under SPP's current approach, any quick-start

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[52] Golden Spread Initial Brief at 4.

[53] *Id.* at 5.

[54] SPP Market Monitor Initial Brief at 13-14 & n.25.

[55] Golden Spread Initial Brief at 4-5.

[56] SPP Market Monitor Initial Brief at 9.

[57] Basin Electric Initial Brief at 5-6.

resources that would be dispatched below their economic minimum operating limit are "screened out" and not considered available for dispatch in the following unified pricing and dispatch run. Consequently, resources may be removed from the set of available resources and the dispatch schedules calculated by the unified pricing and dispatch run may be based on a set of available resources that does not include the least cost available resources. By not including all resources that are available for dispatch, the unified pricing and dispatch run may produce an inefficient dispatch that does not minimize production costs.

45. Second, SPP's use of a screening run may create risks to system reliability by increasing the potential for an imbalance between dispatched generation and load. Specifically, SPP's use of a screening run may result in dispatch solutions that underestimate actual energy production because it purposely and erroneously assumes that some quick-start resources are offline (because of the screening run) when such resources are physically incapable of turning off due to minimum run time constraints.[58] Ignoring the physical limitations of resources in this manner may cause a system power imbalance that must be managed through the use of frequency regulation resources. By contrast, under separate pricing and dispatch runs, the dispatch run would not exclude quick-start resources that are online in determining dispatch. As a result, the dispatch run would respect the power balance constraint and would achieve the same delivery of power at a lower cost by making unnecessary the use of frequency regulation resources to manage imbalances. SPP's current approach therefore unnecessarily increases the cost of serving load and puts stress on the frequency regulation resources that are necessary for maintaining system reliability.

46. Third, the unified pricing and dispatch run that currently follows the screening run may unnecessarily increase the cost of serving load by misrepresenting the costs of quick-start resources in the process for determining dispatch instructions. SPP's current approach uses incremental cost curves that incorporate amortized commitment costs for both pricing *and dispatch*, but the appropriate approach (as directed by the Commission below) would use incremental cost curves that incorporate amortized commitment costs *only for purposes of pricing*. We find that SPP's current approach fails to ensure that production costs are minimized because the dispatch model does not have accurate cost information to optimize over while it determines dispatch. Specifically, quick-start resources with amortized commitment costs included in the incremental cost components of their offers may be dispatched to lower output levels relative to the minimum production cost solution.

47. To remedy these concerns, and consistent with the discussion above, we direct SPP to modify its real-time energy market clearing process to execute the cost-

[58] Golden Spread raised this as a concern in its comments on the NOPR. Golden Spread, Comments, Docket No. RM17-3-000, at 12 (filed Feb. 28, 2017).

minimizing dispatch solution, which will produce the dispatch instructions that are sent to supply resources, and then perform a subsequent pricing run to determine prices that would not impact the dispatch instructions sent to supply resources. In addition, we direct SPP to remove its screening run, and remove amortized commitment costs from the incremental cost curves of quick-start resources used in the dispatch run.

48. We disagree with SPP's argument that the screening run ensures resources' physical limitations for dispatch are honored. We find that, as discussed above, SPP's screening run may instruct resources to turn off when those resources are not physically capable of turning off. In contrast, under the modifications required above, quick-start resources' physical limitations will still be recognized for purposes of dispatch.

3. Reflecting Commitment Costs in Prices

a. December 2017 Order

49. In the December 2017 Order, the Commission preliminarily found that SPP's practice of not accounting for quick-start resources' commitment costs in its pricing logic may be unjust and unreasonable because it does not accurately represent the marginal cost of serving load.[59] The Commission stated that the costs of commitment decisions for fast-start resources are incurred to serve system needs in a similar way that marginal costs are incurred to serve system needs for a specific time period. The Commission further stated that incorporating commitment costs of quick-start resources in prices more accurately represents the marginal cost of serving load, which will help inform investment decisions. For these reasons, the Commission preliminarily found that commitment costs of registered and unregistered quick-start resources in SPP should be considered marginal for purposes of setting prices in SPP.[60]

50. The Commission concluded that, upon initial review, SPP could remedy this practice that potentially leads to unjust and unreasonable rates by modifying its pricing

[59] The Commission noted that SPP currently does account for a registered quick-start resource's commitment costs when the resource opts to include commitment costs through adders to its incremental energy offers. December 2017 Order, 161 FERC ¶ 61,296 at P 15 (citing SPP, OATT, Sixth Revised Volume No. 1, Attachment AF, § 3.2 (E.3) (4.1.0)).

[60] *Id.* PP 15, 18.

logic to allow the commitment costs of quick-start resources (including all such resources even if they have not registered as quick-start resources) to be reflected in prices.[61]

b. Initial Briefs

51. Basin Electric and Golden Spread generally agree with the Commission's preliminary finding that commitment costs should be included in the energy offers of quick-start resources for the purpose of setting prices.[62] SPP, the SPP Market Monitor, and Sunflower/Mid-Kansas oppose the inclusion of quick-start resources' commitment costs in offers.[63]

52. SPP states that it would prefer to incorporate commitment costs using its current unified pricing and dispatch processes, i.e., its ex-ante pricing system.[64] SPP seeks clarity from the Commission about whether commitment costs should be included in price formation every time a quick-start resource is committed and dispatched, or only when committed and dispatched to meet an unforeseen real-time need that no other non-quick start resource can meet.[65] Additionally, SPP seeks clarity from the Commission on several design and operational details. First, SPP seeks clarity about which start-up offer and no-load offer should be included in pricing when multiple quick-start resources are selected, and which megawatts (e.g., economic maximum, economic minimum, or dispatch megawatts) would be used to convert the costs to a per-megawatt value. Second, SPP seeks clarity about the method for determining the interval over which commitment costs will be amortized. Finally, SPP asks whether prices should be adjusted with a quick-start resource's commitment costs on a locational or regional basis, and states it believes a locational approach would more accurately reflect the marginal cost of serving load.[66]

53. Basin Electric states that SPP's current approach, which allows registered quick-start resources to manually adjust offers to include commitment costs, results in inconsistent prices, and that allowing quick-start resources' commitment costs to be

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[61] *Id.* P 25.

[62] Basin Electric Initial Brief at 7; Golden Spread Initial Brief at 5.

[63] Sunflower/Mid-Kansas Initial Brief at 5-6.

[64] SPP Initial Brief at 11.

[65] *Id.* at 12.

[66] *Id.* at 14-15.

reflected systematically in prices would ensure similar resources are priced in a similar manner.[67] Golden Spread asserts that an RTO's/ISO's dispatch solution should include market pricing that reflects the costs of quick-start resources so that quick-start resources are not committed when prices are below the costs of the resource. Golden Spread states that reflecting quick-start resources' commitment costs in prices creates transparency and reduces uplift payments.[68] Westar states that the commitment of quick-start resources to resolve transient operational issues should be considered marginal, including their commitment costs. Westar asserts that market prices are often artificially reduced when a quick-start resource is dispatched but a lower marginal cost resource with dispatchable megawatts sets price. Westar contends that this results in significant market uplift to make the dispatched fast-start resource whole.[69]

54. The SPP Market Monitor argues that the amortization of commitment costs should be removed from the aggregated offer curve after a quick-start resource's minimum run time is complete, because otherwise prices will be artificially inflated and the resource may over-recover its costs. The SPP Market Monitor asserts that commitment costs should be amortized over the resource's economic maximum limit, because if amortized over a resource's economic minimum limit the energy offer curve will be artificially high. Additionally, the SPP Market Monitor requests clarification regarding how start-up costs should be amortized as the minimum run time approaches zero, and argues that as technology improves and minimum run times decrease, the amortized start-up cost will increase the dollars per megawatt-hour offer.[70]

55. Golden Spread argues that quick-start resources' commitment costs should be included in both the real-time and day-ahead markets because allowing different cost components in each market could create uncertainties, inefficiencies, and price distortion.[71] Basin Electric requests that quick-start resources in locally or frequently constrained areas should not be allowed to set prices for the whole market.[72] Basin Electric states that the Commission should direct SPP to provide a mechanism for

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[67] Basin Electric Initial Brief at 7.

[68] Golden Spread Initial Brief at 5.

[69] Westar Initial Brief at 3.

[70] SPP Market Monitor Initial Brief at 24-25.

[71] Golden Spread Initial Brief at 5-6.

[72] Basin Electric Initial Brief at 7.

defining such areas and ensuring that their resources do not set prices.[73] Westar similarly argues that commitment costs should only be reflected in prices on a locational basis within the Marginal Congestion Cost LMP component, and that commitment costs, or energy make-whole costs, should never be formulated into market-wide pricing components such as Marginal Energy Cost LMP. Westar argues that spreading such costs across the footprint fails to send correct locational price signals to local transmission owners and system planners.[74]

56. Sunflower/Mid-Kansas argues that recovery of commitment costs can result in overinflated LMP and would be unduly discriminatory against other resources that are not able to include commitments costs in their energy offers. Similarly, Sunflower/Mid-Kansas argue that relaxing quick-start resources' economic minimum operating limits for price-setting purposes and applying quick-start pricing to unregistered quick-start resources would treat quick-start resources more favorably than other resources.[75]

c. Reply Briefs

57. KCP&L/Westar state that while market prices would ideally reflect commitment costs, there is not currently a viable path to reaching such an outcome on an ex-ante basis because the interval over which such costs should be amortized is never known at the time of a resource's commitment, and because of the administrative costs associated with implementing ex-post pricing.[76] The SPP Market Monitor opposes Basin Electric's and Westar's requests to prohibit quick-start resources in locally or frequently constrained areas from setting prices for the whole market, arguing that excluding a certain type of resource from setting the marginal energy component of prices undermines the basic principles of LMP.[77]

d. Determination

58. Consistent with the December 2017 Order, we find that failing to include commitment costs for quick-start resources in prices would not accurately represent the marginal cost of serving load, and therefore find SPP's current practice of not incorporating quick-start resources' commitment costs in its price-setting logic is unjust

[73] *Id.* at 8.

[74] Westar Initial Brief at 5.

[75] Sunflower/Mid-Kansas Initial Brief at 5-6.

[76] KCP&L/Westar Reply Brief at 4.

[77] SPP Market Monitor Reply Brief at 8-10.

and unreasonable. As noted above, because of their operating characteristics, quick-start resources are uniquely situated to respond to unforeseen or transient real-time system needs. When quick-start resources are committed in real-time, it is often at short notice to meet some unforeseen or transient system condition or market need over a short time period, and, as such, we find that the commitment costs for such a resource should be considered marginal costs. Thus, we find that incorporating the commitment costs of quick-start resources in prices more accurately represents the marginal cost of serving load when a quick-start resource is needed to quickly respond to unforeseen or transient system needs, which will better reflect system needs, and help inform investment decisions, as discussed above in section IV.B.1.d. In addition, if commitment costs are not included, the marginal resource must be compensated through out-of-market uplift payments, which provide a less transparent price signal than compensating resources through market clearing prices that reflect the marginal cost of production. Accordingly, we direct SPP to reflect the commitment costs of quick-start resources in prices, including all such resources even if they have not registered as quick-start resources.

59. We disagree with arguments that it is unduly discriminatory to allow quick-start resources to include their commitment costs in their pricing. As discussed above, because of their operating characteristics and unique ability to respond to unforeseen or transient real-time system needs, the commitment costs of quick-start resources should be considered marginal costs. The same rationale does not apply to resources that are not able to start quickly to respond to unforeseen or transient real-time system needs, and we find that the commitment costs of such resources should not be considered marginal costs.

60. We also dismiss arguments that the inclusion of commitment costs in quick-start pricing would unreasonably increase prices. Quick-start pricing ensures prices more accurately reflect the marginal cost of serving load. Not allowing prices to reflect quick-start resources' commitment costs understates prices and requires SPP to make uplift payments to those quick-start resources that could not recover their commitment costs through LMP.

61. In its initial brief, SPP seeks clarification on various aspects of including commitment costs in price formation.[78] We clarify that SPP should include quick-start resources' commitment costs in energy offers in the pricing run. If a quick-start resource is the marginal unit and therefore sets price, then the price will reflect the marginal quick-start resource's commitment costs. In response to SPP's request for clarification regarding the method for reflecting commitment costs in pricing when multiple quick-start resources are selected, to the extent that multiple quick-start resources are selected

[78] SPP Initial Brief at 12-14.

for dispatch, they each will receive their respective LMPs that – in this scenario – should equal or exceed their costs.

62. SPP also seeks guidance regarding the method for amortizing commitment costs.[79] We will not require SPP to implement a specific amortization method; rather, we will provide SPP with the flexibility to propose its own amortization method on compliance – so long as it is just and reasonable. We note, however, that a method that amortizes commitment costs over the quick start resource's economic maximum operating limit and its minimum run time is a reasonable approach.

63. With regard to SPP, Basin Electric, and Westar's arguments that quick-start resources' commitment costs should only be reflected in prices on a locational basis, we clarify that SPP should not limit quick-start prices to a local area or region, except as such prices are naturally limited to local areas or regions due to binding constraints as part of SCED. When SCED determines that quick-start pricing should affect only prices in a local area, then it will only affect prices in that local area. But when SCED determines that quick-start pricing should affect prices on a system-wide basis, then it should affect prices on a system-wide basis.

64. We agree with Golden Spread that quick-start resources' commitment costs should be included in both the real-time and day-ahead markets. Failure to incorporate commitment costs in both markets would result in prices that fail to reflect the marginal cost of serving load in each market, would hinder price transparency, and would limit convergence between the day-ahead and real-time markets, resulting in rates that are not just and reasonable. Under identical market conditions, the day-ahead and real-time markets could produce different energy prices because the day-ahead market does not incorporate the commitment costs of quick-start resources in energy prices. Further, it could provide an arbitrage opportunity for virtual traders. Accordingly, we direct SPP to include a price-setting quick-start resource's commitment costs in both the day-ahead market and the real-time market. We find that such a directive would allow quick-start resources the opportunity to set price in both the day-ahead and real-time markets, avoid arbitrage opportunities that increase divergence between these markets, and promote price transparency.

4. Minimum Run Time Requirement

a. December 2017 Order

65. In the December 2017 Order, the Commission noted that SPP's Tariff does not include a minimum run time requirement for a resource to receive quick-start pricing treatment. The Commission stated that it was concerned that resources with minimum

[79] *Id.* at 14-15.

run times in excess of an hour may lack the flexibility to operate in a manner consistent with transient real-time needs, and that, as a result, commitment and dispatch of resources with a minimum run time in excess of an hour do not appear analogous to a marginal decision. Therefore, the Commission stated, applying fast-start pricing logic to such units could result in prices failing to reflect the marginal cost of serving load. The Commission thus preliminarily found that it may be unjust and unreasonable for resources with a minimum run time of greater than one hour to receive quick-start pricing treatment.[80]

b. Initial Briefs

66. SPP agrees that a quick-start resource should have a minimum run time requirement. SPP states that, upon the resolution of this proceeding, it proposes to incorporate a one hour minimum run time requirement into the definition of quick-start resources in its Tariff.[81]

67. Most of the commenters support requiring quick-start resources to have a minimum run time of one hour or less.[82] Sunflower/Mid-Kansas agree with the Commission that the absence of a minimum run time requirement for quick-start resources could result in prices that do not reflect marginal cost because resources lacking the requisite operating flexibility may be committed and dispatched.[83] The SPP Market Monitor states that it agrees with the Commission's proposed requirement of a minimum run time of one hour or less for eligibility as a quick-start resource.[84] Westar states that it agrees that SPP's practice of not requiring quick-start resources to have a minimum run time is unjust and unreasonable.[85] Golden Spread states that it may be appropriate to apply quick-start pricing to resources with minimum run times of more

[80] December 2017 Order, 161 FERC ¶ 61,296 at P 20.

[81] SPP Initial Brief at 8.

[82] SPP Market Monitor Initial Brief at 9, 12; Golden Spread Initial Brief at 7; Sunflower/Mid-Kansas Initial Brief at 9.

[83] Sunflower/Mid-Kansas Initial Brief at 9.

[84] SPP Market Monitor Initial Brief at 12.

[85] Westar Initial Brief at 2-3.

than one hour, but that a minimum run time of one hour or less is appropriate for purposes of this proceeding.[86]

68. Basin Electric supports defining a minimum run time for quick-start resources, but states that the Commission should direct SPP to study the effect of setting minimum run times for quick-start resources rather than directing SPP to adopt a minimum run time requirement of one hour or less. Basin Electric states that there is insufficient evidence that requiring quick-start resources to have a minimum run time of one hour or less will ensure flexibility for quick-start resources. Basin Electric states that if the Commission directs SPP to conduct such a study, the study should include considerations such as the effect of avoiding uplift payments on pricing. Basin Electric states that by keeping minimum run time low, dispatch can minimize uplift from the resources and send more accurate price signals by reflecting a more complete value for using the resources to address transient issues.[87]

c. Reply Briefs

69. The SPP Market Monitor reiterates that it agrees that quick-start resources should have a minimum run time of less than or equal to one hour.[88] SPP states that it agrees with specifying a minimum run time requirement for quick-start resources.[89]

d. Determination

70. We find that SPP's practice of not requiring quick-start resources to have a minimum run time requirement is unjust and unreasonable. Consistent with our preliminary findings in the December 2017 Order, we find that resources with minimum run times in excess of an hour lack the flexibility to respond to transient real-time needs, and as a result the commitment and dispatch of resources with minimum run times in excess of an hour is not analogous to a marginal decision.[90] Therefore, applying quick-start pricing logic to such resources would result in prices failing to reflect the marginal cost of serving load when a quick-start resource is needed to quickly respond to

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[86] Golden Spread Initial Brief at 7.

[87] Basin Electric Initial Brief at 8-9.

[88] SPP Market Monitor Reply Brief at 2.

[89] SPP Reply Brief at 7.

[90] We note that there is no bright line between what is marginal and what is not marginal. However, at some point resources have long enough minimum run times that the commitment of the resource cannot be considered analogous to a marginal decision.

unforeseen system needs. Therefore, we conclude that SPP's practice of allowing resources with minimum run times of more than one hour to receive quick-start pricing treatment is unjust and unreasonable.

71. We direct SPP to include in the definition of quick-start resources a requirement that those resources have a minimum run time of one hour or less. We find that this requirement will limit quick-start pricing treatment only to those resources whose commitment and dispatch can be considered analogous to a marginal decision.

72. With regard to Basin Electric's request that we direct SPP to study the effect of setting a minimum run time requirement and whether a requirement of one hour or less will ensure quick-start resources are flexible, we are not persuaded to require such a study. We do not believe that such a study is warranted at this time because it is unclear what additional evidence would be gained from the study.

5. Relaxing Economic Minimum Operating Limit

a. December 2017 Order

73. In the December 2017 Order, the Commission preliminarily found that SPP's practice of not allowing the relaxation of the economic minimum operating limit of block-loaded or other quick-start resources needed to serve load could produce prices that do not reflect the marginal cost of serving load. The Commission stated that prices are set by the next dispatchable megawatt, which may come from a lower cost resource that was dispatched down to maintain power balance upon the need for the quick-start resource, and prices will not reflect the cost of quickly responding to unforeseen system needs.[91]

74. Additionally, the Commission stated that, given SPP's screening run, the set of quick-start resources available for the purpose of setting prices may not reflect actual conditions or allow quick-start resources to set prices.[92]

75. The Commission concluded that, upon initial review, SPP could remedy this practice that potentially leads to unjust and unreasonable rates by allowing for the relaxation of all quick-start resources' economic minimum operating limit by up to

[91] December 2017 Order, 161 FERC ¶ 61,296 at P 22.

[92] *Id.*

100 percent, such that the resources are considered dispatchable from zero to their economic maximum operating limit for the purpose of setting prices.[93]

b. Initial Briefs

76. Golden Spread supports the relaxation of a quick-start resource's economic minimum operating limit by up to 100 percent for the purpose of setting prices.[94] The SPP Market Monitor, Basin Electric, and Oklahoma Gas & Electric do not support the relaxation of the economic minimum operating limit for the purpose of setting prices.[95]

77. The SPP Market Monitor states that relaxing the economic minimum operating limit of quick-start resources will: (1) distort prices and create inefficiencies by ignoring the actual physical parameters of quick-start resources; (2) create incentives for resources to provide less flexibility, potentially increasing the number of block-loaded resources in SPP and reducing the benefits of a potential future ramping product; and (3) potentially increase production costs because resources backed down to accommodate block-loaded resources will still be paid as if they were producing their original amount.[96]

78. Basin Electric states that if the Commission continues to be concerned with the economic minimum operating limit for the pricing run, the Commission should (1) set a specific set of requirements for block-loaded resources; (2) develop a mechanism for addressing over-generation associated with the dispatch of block-loaded resources in the SPP tariff; and (3) direct SPP to study the implications of such a change before implementing it.[97]

c. Reply Briefs

79. SPP states that relaxing a quick-start resource's economic minimum operating limit is unduly preferential to quick-start resources and would misrepresent actual availability of resources in a way that runs counter to marginal cost pricing. SPP reasserts that the relaxation of the economic minimum operating limit for the purpose of

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[93] *Id.* P 25.

[94] Golden Spread Initial Brief at 8.

[95] Basin Electric Initial Brief at 5; Oklahoma Gas & Electric Initial Brief at 8-9; SPP Market Monitor Initial Brief at 13-19, 28-29.

[96] SPP Market Monitor Initial Brief at 13-18, 18-19, 28-29.

[97] Basin Electric Initial Brief at 6.

setting prices runs counter to marginal cost pricing, and will lead to distorted prices that do not accurately reflect marginal costs.[98]

80. The SPP Market Monitor asserts that, although relaxing a quick-start resource's economic minimum operating limit may reduce uplift for quick-start resources, uplift for other resources will likely increase because resources that are dispatched down to accommodate quick-start resources may be given lost opportunity cost payments.[99] If the Commission proceeds with the proposal to relax the economic minimum operating limit of quick-start resources, the SPP Market Monitor suggests that the Commission should consider requiring a cap on the economic minimum operating limit of quick-start resources. Specifically, the SPP Market Monitor expresses concern that physically independent engines may register as one aggregate quick-start resource, raising the economic minimum operating limit of the registered resource and increasing uplift paid to the flexible resources dispatched down.[100]

81. KCP&L/Westar support the relaxation of the economic minimum operating limit for the purpose of setting prices, and state that this remedy would simply allow marginal quick-start units to set price more often and would not require ex-post pricing.[101]

d. Determination

82. Consistent with the Commission's preliminary finding in the December 2017 Order, we find that SPP's practice of not allowing the economic minimum operating limit of block-loaded quick-start resources or other quick-start resources needed to serve load to be relaxed could restrict the set of dispatch circumstances in which such resources could set price. We remain concerned that without allowing this relaxation, marginal actions taken by system operators will not be reflected in prices. As a result, SPP's practices lead to prices in the day-ahead and real-time markets that fail to reflect the marginal cost of serving load when committing a quick-start resource is the marginal action taken by system operators. These inaccurate price signals then fail to inform investment decisions, including where and when quick-start resources should be built or maintained. Furthermore, not requiring a consistent practice between the real-time and day-ahead markets will hinder price transparency and limit convergence between them, resulting in rates that are not just and reasonable. Under identical market conditions, the day-ahead and real-time markets could produce different energy prices because the

[98] SPP Reply Brief at 5-6.

[99] SPP Market Monitor Reply Brief at 6-7.

[100] *Id.* at 7-8.

[101] KCP&L/Westar Reply Brief at 3-4.

treatment of quick-start resources in the day-ahead market is inconsistent with those in the real-time markets. Further, it could provide an arbitrage opportunity for virtual traders. For these reasons, we find that SPP's practices are unjust and unreasonable.

83. Accordingly, we direct SPP to allow for relaxation of all quick-start resources' economic minimum operating limits by up to 100 percent, such that the resources are considered dispatchable from zero to their economic maximum operating limits, for the purpose of setting prices in both the day-ahead and real-time markets.

84. We disagree with the SPP Market Monitor and Basin Electric that quick-start pricing is likely to incentivize resources to provide less flexibility. The SPP Market Monitor and Basin Electric fail to recognize that the resources eligible for quick-start pricing treatment are flexible in that these resources can economically respond to unforeseen or transient system needs. The changes required in this order specifically limit quick-start pricing to these resources so as to send appropriate long-run price signals.

85. We disagree with SPP's argument that relaxing a quick-start resource's economic minimum operating limit is unduly preferential to quick-start resources. Rather, relaxing quick-start resources' economic minimum operating limits allows them to set price in the same way that dispatchable resources are able to set price. Also, quick-start resources themselves receive no more revenues under quick-start pricing than they do under traditional LMP/uplift pricing. Additionally, we find that the SPP Market Monitor's concerns about aggregated quick-start resources increasing uplift are speculative and not supported by the record. For similar reasons, we decline to adopt the SPP Market Monitor's proposal to set a cap on the economic minimum operating limits of quick-start resources. However, to the extent SPP observes an increase in uplift payments to aggregated quick-start resources in the future and considers it problematic, SPP may choose to address this in a separate FPA section 205 filing.[102]

6. Unregistered Quick-Start Resources

a. December 2017 Order

86. In the December 2017 Order, the Commission stated that, instead of applying quick-start pricing to all resources that meet the physical requirements of quick-start resources, SPP allows market participants with such resources the option to choose whether to register them as quick-start resources. The Commission noted that registered and unregistered quick-start resources have the same physical characteristics. The Commission preliminarily found that its concerns regarding the dispatch and pricing of

[102] 16 U.S.C. § 824d.

quick-start resources apply to unregistered quick-start resources and, because SPP distinguishes between registered and unregistered quick-start resources for purposes of setting price and including commitment costs, SPP's quick-start pricing logic may result in unjust and unreasonable rates.[103]

87. The Commission concluded that, upon initial review, SPP could remedy this practice that potentially leads to unjust and unreasonable rates by considering both registered and unregistered quick-start resources in quick-start pricing.[104]

b. Initial Briefs

88. SPP argues that it is important to identify resources that choose to be treated as quick-start resources. SPP explains that, although it does not currently have a formal registration requirement, resources that desire quick-start pricing treatment must indicate to SPP a specific commitment status, start-up time, and minimum run time. SPP asserts that registration is valuable because it requires demonstration of actual performance ability and identifies resource types for market monitoring. SPP contends that applying quick-start pricing treatment to unregistered quick-start resources could facilitate gaming, incent the exercise of market power, and cause pricing logic issues. SPP cautions that resources may re-characterize their operating parameters (e.g., by increasing their start-up times from 10 to 11 minutes) if they do not want to be subject to quick-start pricing treatment, which SPP states could place a greater burden on the SPP Market Monitor.[105]

89. Oklahoma Gas & Electric asserts that the Commission should not require SPP to apply its quick-start pricing logic to resources that are not registered quick-start resources, and that a market participant should be able to choose whether its resource will be dispatched as a quick-start resource.[106] Basin Electric cautions that requiring unregistered quick-start resource participation places a burden on SPP to identify those resources and could lead to inconsistencies in the marketplace. Basin Electric states that, to the extent the Commission directs SPP to consider unregistered quick-start resources,

[103] December 2017 Order, 161 FERC ¶ 61,296 at P 23.

[104] *Id.* P 25.

[105] SPP Initial Brief at 21-22.

[106] Oklahoma Gas & Electric Initial Brief at 9-10.

the Commission should first direct SPP to define quick-start resources under the SPP tariff.[107]

90. Golden Spread argues that the registration of a resource is irrelevant and that proper price formation is promoted by capturing and considering the characteristics of all quick-start resources in both real-time and day-ahead prices. Golden Spread acknowledges that entities may have legitimate business reasons for not registering their resources, but asserts that quick-start resources with similar physical characteristics should be treated identically.[108] Westar also states that any quick-start resources that can be committed for short-term response, such as for reliability, should participate in LMP price formation, even if the asset owner chooses not to register the unit as a quick-start resource.[109]

91. The SPP Market Monitor states that a generator capable of providing energy as a quick-start resource should not withhold that capability from the market via registration. The SPP Market Monitor cautions, however, that market participants could avoid offering as a quick-start resource by making a simple parameter change. The SPP Market Monitor states that, unlike other RTO/ISO tariffs, SPP's tariff does not clearly require non-dollar parameters to represent accurate, physical, and verifiable limitations. The SPP Market Monitor also asserts that quick-start resources could opt out of quick-start pricing by submitting a manual or offline control status. The SPP Market Monitor argues that, to avoid manipulation, SPP's Tariff would need to be modified to require that non-dollar-based parameters be accurate and verifiable, and to set forth limits on submitting a manual control status.[110]

c. Reply Briefs

92. SPP argues that the Commission should not require SPP to consider both registered and unregistered quick-start resources for purposes of setting price. SPP contends that doing so would place an unnecessary burden on SPP to identify the unregistered quick-start resources. Additionally, SPP states that forcing quick-start

[107] Basin Electric Initial Brief at 9-10.

[108] Golden Spread Initial Brief at 6, 8.

[109] Westar Initial Brief at 4 & n.5.

[110] SPP Market Monitor Initial Brief at 20-23.

pricing logic upon market participants that do not want quick-start pricing treatment would be a significant encroachment on those entities' resource management.[111]

93. The SPP Market Monitor contends that SPP's current Tariff language requiring resources to submit accurate parameters is not sufficient to cover situations where participants change their start-up or minimum run time parameters to qualify or disqualify as a quick-start resource. The SPP Market Monitor asserts that SPP should modify this language so that it applies more clearly to all parameters in all intervals in both the day-ahead and real-time markets, and so that it more explicitly defines the basis for evaluating accuracy (e.g., physical and/or environmental limitations). Additionally, the SPP Market Monitor states that the accuracy requirement should be moved to the tariff section on offer submittals, which is a more appropriate location because market participants communicate parameters through offers.[112]

d. Determination

94. Consistent with the Commission's preliminary finding in the December 2017 Order, we find that it is unjust and unreasonable for SPP to preclude unregistered quick-start resources from quick-start pricing.[113] We find that under SPP's current practice, prices do not reflect the marginal cost of serving load when an unregistered resource that meets the quick-start capability qualifications is needed but is not included in quick-start pricing logic. Because unregistered quick-start resources have the same physical characteristics as registered quick-start resources, we find that the same concerns discussed above with regard to quick-start resources being considered for dispatch in a manner that does not minimize production costs, not being eligible to set price, and not being able to include commitment costs in offers apply to unregistered quick-start resources as well. We agree with Golden Spread that quick-start resources with similar physical characteristics should be treated the same.[114] Therefore we find that SPP's current practice is unjust and unreasonable.

95. We find that expanding quick-start pricing to unregistered resources that meet the capability qualifications of quick-start resources will enable prices to reflect the marginal cost of serving load when those quick-start resources are needed to quickly respond to unforeseen system needs. As such, we direct SPP to apply quick-start pricing to all resources that meet the quick-start capability qualifications, not only to those resources

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[111] SPP Reply Brief at 6-7.

[112] SPP Market Monitor Reply Brief at 3-5.

[113] December 2017 Order, 161 FERC ¶ 61,296 at PP 6, 23.

[114] Golden Spread Initial Brief at 6, 8.

that have registered as quick-start resources. This expansion, along with the other reforms directed herein, will make SPP's quick-start pricing practices just and reasonable.

96. Additionally, despite claims to the contrary, we do not anticipate that market participants will change their resources' operating parameters to avoid qualifying as quick-start resources. No party has demonstrated why market participants would prefer that their resources not qualify for quick-start pricing, and we are not convinced that mandatory participation would prompt market participants to misrepresent their resources' capabilities. We are also not convinced that it would be unduly burdensome for SPP and the SPP Market Monitor to monitor this potential misrepresentation. For similar reasons, we find there is not sufficient information in the record demonstrating a need for SPP to more clearly define the requirement for market participants to submit accurate resource parameters, as the SPP Market Monitor requests. To the extent SPP believes additional Tariff revisions may help prevent resources from submitting inaccurate resource parameters to qualify or disqualify as quick-start resources, SPP may develop and submit proposed Tariff revisions to address those concerns on compliance.

97. We disagree with SPP that identifying unregistered quick-start resources will be a burden, as such a determination can be made by a simple examination of the resources' offer parameters. We also disagree with SPP that forcing quick-start pricing logic upon market participants that do not want quick-start pricing treatment would be an inappropriate encroachment on those entities' resource management. SPP appears to argue that resources should be able to choose whether the quick-start pricing that the Commission finds is the appropriate, marginal cost-based pricing mechanism should apply to their resources. We disagree. In finding that quick-start pricing is the appropriate pricing mechanism, we also find that it should apply to all resources that meet the quick-start capability qualifications. Resources with operating characteristics that enable them to start quickly should be priced in a way that reflects their marginal costs (i.e., by allowing them to set price and include their commitment costs in offers). This order does not require any entity to provide any services. However, to the extent that market participants offer resources with quick-start capabilities into the market, we find those resources should be priced this way to ensure prices reflect the marginal cost of serving load. Allowing some resources with the same quick-start operating characteristics to opt out of quick-start pricing would result in the costs of those resources not being reflected in prices when those resources are marginal, resulting in prices that fail to reflect the marginal cost of serving load – an outcome we find to be unjust and unreasonable. Quick-start pricing is not an optional benefit for a quick-start resource, but an approach to sending proper price signals to the entire market.

98. For these reasons, we find that quick-start pricing practices should be applied to all resources that meet the capability qualifications discussed herein (i.e., can start-up in 10 minutes or less and have a minimum run time of one hour or less).

7. Reflecting Quick-Start Pricing Practices in Tariff

a. December 2017 Order

99. In the December 2017 Order, the Commission preliminarily found that SPP's practices related to quick-start pricing significantly affect the rates, terms, and conditions of service and, as such, must be filed with the Commission as part of the SPP Tariff.[115]

b. Initial and Reply Briefs

100. SPP agrees with the Commission that its quick-start pricing rules should be set forth in its Tariff.[116] Several other parties also support reflecting SPP's quick-start pricing practices in the SPP Tariff.[117] Golden Spread notes that some operational details or clarifying materials could be included in SPP's business practice manuals and market protocols. Golden Spread states that SPP and its stakeholders should present their initial view of which details belong within the Tariff.[118]

c. Determination

101. We find that SPP's practices related to quick-start pricing significantly affect the rates, terms, and conditions of service and therefore direct SPP on compliance to file its quick-start pricing rules with the Commission as part of the SPP Tariff. The FPA requires all practices that significantly affect rates, terms, and conditions of service to be on file with the Commission, and these practices must be included in a Commission-accepted tariff.[119] SPP's quick-start pricing practices have a material effect on electric

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[115] December 2017 Order, 161 FERC ¶ 61,296 at P 24.

[116] SPP Initial Brief at 8; SPP Reply Brief at 7.

[117] Basin Electric Initial Brief at 4; Golden Spread Initial Brief at 9; SPP Market Monitor Initial Brief at 9, 12; SPP Market Monitor Reply Brief at 2; Sunflower/Mid-Kansas Initial Brief at 3.

[118] Golden Spread Initial Brief at 9.

[119] 16 U.S.C. § 824d(c); *Demand Response Coalition v. PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,061, at P 17 (2013); *Cargill Power Markets, LLC v. Public Service Company of New Mexico*, 141 FERC ¶ 61,141, at P 14 (2012); *see generally Prior Notice and Filing Requirements Under Part II of the FPA*, 64 FERC ¶ 61,139 (1993) (explaining Commission jurisdiction with respect to all rates and charges that are

power rates because they affect prices in the SPP energy market. For example, allowing quick-start resources to set prices by relaxing their economic minimum operating limits and including quick-start resources' commitment costs in their offers can affect the market clearing price. Because SPP's quick-start pricing practices significantly affect the rates, terms, and conditions of service, we require SPP to reflect its quick-start pricing rules in its Tariff.[120]

8. Over-Generation and Price-Chasing Behaviors

a. December 2017 Order

102. In the December 2017 Order, the Commission encouraged SPP to develop a mechanism to address over-generation and price-chasing to the extent SPP identified these issues as potential problems. The Commission listed as potential approaches for SPP to consider "penalizing uninstructed deviations, settling over-generated MWh at only standard locational marginal price (not at the higher prices determined through quick-start pricing) or providing for lost opportunity cost payments."[121]

b. Initial and Reply Briefs

103. SPP expresses concern that separating pricing and dispatch decisions will require further analysis about price-chasing and resources' failure to follow dispatch instructions.[122] Westar states that introducing commitment costs into ex-ante dispatch pricing can cause price-chasing resources to flood the market, and possibly cause over-generation. Westar states that MISO solves this problem by using ex-post pricing for settlements but marginal dispatch pricing without fast-start commitment costs in its ex-ante dispatch engines, similar to SPP's current practice. Westar states that another option would be to include commitment costs in ex-ante dispatch pricing but remove quick-start pricing cost formulations from any price-chasing self-scheduled resources in ex-post

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"for or connected with" and all agreements that "affect or relate to" jurisdictional activities).

[120] SPP may, on compliance, propose revisions to other governing documents as necessary. Consistent with the Commission's "rule of reason" policy, SPP may include implementation details related to quick-start pricing in its business practice manuals. *See Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, 118 FERC ¶ 61,119, at PP 1649-51 (2007).

[121] December 2017 Order, 161 FERC ¶ 61,296 at P 26.

[122] SPP Initial Brief at 13.

settlement pricing. Westar explains that this formulation, however, would also require development of an ex-post type of pricing formulation for self-committed and self-scheduled resources.[123]

104. The SPP Market Monitor states that the revised quick-start design should include an unequivocal expectation to follow dispatch. The SPP Market Monitor states that the December 2017 Order encouraged SPP to develop a mechanism that would discourage a generator from price chasing and therefore ignoring dispatch.[124] The SPP Market Monitor explains that, under SPP's Tariff, it is unclear under what conditions market participants are expected to follow dispatch instructions, and that the Tariff needs an unequivocal declaration that market participants are expected to reasonably follow dispatch, commitment, and setpoint instructions.[125] The SPP Market Monitor states that such an expectation should go beyond penalties such as uninstructed resource deviation. The SPP Market Monitor states that if the RTO cannot reasonably expect market participants to follow instructions without resorting to directives, then optimal market outcomes will not be achieved and pricing will not be transparent, and the decision to follow dispatch would merely be a calculation of expected cost.[126]

105. The CAISO Market Monitor states that deviation penalties or payments to not deviate from the efficient dispatch do not restore incentive compatibility because market participants would have an incentive to submit bids that do not represent their true costs and valuations.[127]

c. Determination

106. On brief, SPP states that separating pricing and dispatch may necessitate changes to SPP's procedures for uninstructed deviation penalties and reconsideration of how SPP incentivizes resources to follow dispatch.[128] To the extent that SPP finds over-generation from price-chasing resources to be a potential problem after considering the quick-start pricing changes required in this order, and to the extent SPP finds that its current

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[123] Westar Initial Brief at 4-5.

[124] SPP Market Monitor Initial Brief at 26.

[125] *Id.* at 26-27.

[126] *Id.* at 27.

[127] CAISO Market Monitor Initial Brief at 6-7.

[128] SPP Initial Brief at 13-14.

uninstructed deviation penalties[129] are insufficient to address over-generation concerns, SPP may develop any necessary changes or additions to address this issue and include those changes in its compliance filing to ensure that its quick-start pricing logic does not cause over-generation or lead to incentives for resources to deviate from SPP's dispatch instructions.[130]

107. Additionally, SPP may consider whether to modify its current Tariff language to include an unequivocal statement that market participants are expected to reasonably follow dispatch, commitment, and setpoint instructions, as requested by the SPP Market Monitor.[131] The Commission will evaluate any proposals to address over-generation and price-chasing behavior on compliance.

108. The CAISO Market Monitor argues that deviation penalties, as well as payments to not deviate from the scheduling run dispatch, may theoretically create incentives for resources to submit distorted energy offers that do not represent a resource's true marginal cost of production, thereby reducing market efficiency.[132] However, we find that the risk of such a strategy producing unprofitable results will deter market participants from offering in such a manner. Furthermore, we find that while quick-start pricing requires the use of deviation penalties or payments to provide generators with an efficient incentive to follow instructions, so does traditional LMP/uplift pricing. We find that the CAISO Market Monitor's assertions regarding incentive problems associated with deviation penalties or payments are similar to those associated with uplift payments.[133] As such, we are not persuaded by the CAISO Market Monitor's arguments that quick-start pricing creates greater incentive problems than existing LMP/uplift pricing.

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[129] *See* SPP, Tariff, Attachment AE, § 6.4.1 (1.0.0).

[130] *See, e.g.*, *PJM Interconnection, L.L.C.*, 167 FERC ¶ 61,058, at PP 138-139 (2019) (finding PJM proposal to provide lost opportunity cost payments to redispatched resources to be "a just and reasonable and an effective approach to mitigate economic incentives to price chase").

[131] SPP Market Monitor Initial Brief at 26-27.

[132] CAISO Market Monitor Initial Brief at 6.

[133] *Id.*

9. Other Issues

a. Initial Briefs

109. SPP states that it has already developed several quick-start resource-related Tariff and market protocol revisions, known in SPP as "Revision Requests," that have been approved by SPP stakeholders and its Board of Directors, but have not yet been filed with the Commission for approval.[134] SPP states that these Revision Requests may not align with some of the statements in the December 2017 Order, but may address some issues, and therefore SPP requests that the Commission consider the Revision Requests as a part of the present proceeding.[135] SPP states that under the Revision Requests, the economic and physical requirements of a quick-start resource would be evaluated fifteen minutes ahead of real time to determine whether a quick-start resource should be committed.[136] SPP states that this proposal is an improvement over its current design, under which quick-start resources can be committed hours in advance.[137] Additionally, SPP explains that the Revision Requests add a requirement that quick-start resources have a minimum run time of one hour or less.[138]

110. The SPP Market Monitor requests that the Commission hold this proceeding in abeyance while SPP finalizes and files the Revision Requests.[139] The SPP Market Monitor states that the Revision Requests address many of the conceptual problems with SPP's current quick-start resource design and many of the concerns identified in the December 2017 Order.[140] The SPP Market Monitor states that the Revision Requests contain a commitment process for quick-start resources that is largely comparable to other resources, and includes a start-up and shut-down instruction like non-quick-start resources. The SPP Market Monitor states that, like other commitments, the shut-down

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[134] SPP Initial Brief at 3. SPP explains that the Revision Requests have not yet been filed due to technical and scheduling considerations requiring implementation of other system changes. *See also* SPP Market Monitor Initial Brief at 6.

[135] SPP Initial Brief at 4.

[136] *Id.* at 5.

[137] *Id.*

[138] *Id.* at 5-6.

[139] SPP Market Monitor Initial Brief at 2.

[140] *Id.* at 5, 9.

time of the commitment may be adjusted by the commitment process depending on real-time events or the projection thereof.[141]

111. The SPP Market Monitor states that the Revision Requests remove the optionality for quick-start resources to include commitment costs in the commitment decision process. The SPP Market Monitor explains that, under the Revision Requests, all commitment costs of quick-start resources are considered by looking ahead to ensure that the resource would be economic through its minimum run time.[142] The SPP Market Monitor states that the design reflected in the Revision Requests provides a look-ahead feature through short-term intra-day reliability unit commitment such that the real-time clearing prices are forecasted, and a particular resource is recommended to be included in the market solution if its commitment costs could be recovered by the forecasted price during a resource's minimum run time; otherwise the resource would not be considered in the real-time solution.[143]

112. The SPP Market Monitor states that, under the Revision Requests, the resource is dispatched based on the marginal energy costs, not on commitment costs.[144] The SPP Market Monitor also states that the Revision Requests allow only flexible resources that are dispatchable to serve the incremental or decremental load to be allowed to set price, allowing prices to be set by marginal offers.[145]

113. Golden Spread states the Revision Requests were not developed to address LMP concerns or price formation initiatives, but were developed in an attempt to reduce reliability unit commitments for quick-start resources. Golden Spread argues that the Revision Requests do not address LMP price formation, and if filed would in large part fall short of the desired goals of the Commission.[146]

114. Sunflower/Mid-Kansas state that the Revision Requests remove the option for enhanced energy offers that include commitment costs in the dispatch run, consistent

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[141] *Id.* at 8-9.

[142] *Id.* at 11.

[143] *Id.*

[144] *Id.*

[145] *Id.* at 13.

[146] Golden Spread Initial Brief at 3.

with the Commission's suggestion in the December 2017 Order.[147] Oklahoma Gas & Electric argues that the Revision Requests appropriately account for the commitment costs of quick-start resources in the SCED unified pricing and dispatch run.[148]

115. Oklahoma Gas & Electric suggests that SPP develop a ramping product as an alternative way of improving the economic efficiency of SPP's market rules for quick-start resources. Oklahoma Gas & Electric asserts that a new product that compensates resources for providing ramping capability would improve the efficient dispatch of SPP's Integrated Marketplace and reduce the likelihood of over-generation.[149] Oklahoma Gas & Electric states that development of a ramping product in SPP should proceed through SPP's stakeholder process, and requests that the Commission require SPP to submit to the Commission, within six months, an informational filing describing the status of SPP's and its stakeholder's efforts to develop a ramping product.[150] Similarly, the SPP Market Monitor states that under SPP's proposed Revision Requests, the decision to include a quick-start resource may need to be supplemented by a ramping product that accounts for uncertainty in market conditions that arise when market conditions change during the timeframe between the short-term intra-day reliability unit commitment process and the five-minute real-time dispatch.[151]

116. The SPP Market Monitor states that the revised quick-start design should clearly explain how prices are set when a quick-start resource is online due solely to its minimum run time. The SPP Market Monitor explains that a situation could occur where a quick-start resource has a minimum run time of one hour and is dispatched and setting price, but during the hour, wind-powered production increases such that the quick-start resource would be dispatched below its minimum output, or to zero megawatts, if not for its minimum run time. The SPP Market Monitor argues that in this case, the quick-start resource should not set price because allowing an unneeded resource to set price reduces transparency and may reduce total surplus. The SPP Market Monitor notes that non-

[147] Sunflower/Mid-Kansas Initial Brief at 8.

[148] Oklahoma Gas & Electric Initial Brief at 6.

[149] *Id.* at 11.

[150] *Id.* at 12.

[151] SPP Market Monitor Initial Brief at 11-12.

quick-start resources are not allowed to set price when they are must-run due to minimum run time.[152]

117. SPP states that separating pricing and dispatch may lead to issues around the mitigation process because its mitigation logic is embedded in the current unified pricing and dispatch run. SPP also states that it may need to evaluate any impacts to Violation Relaxation Limits, Instantaneous Load Capacity requirements, and operating reserve requirements. Additionally, SPP asserts that a potential alternative method of providing price transparency that would also allow SPP to retain its current approach to calculating LMP would be the creation of a separate product that would compensate resources for being able to start quickly to address unforeseen real-time, short-term events.[153] Golden Spread argues that the development of specific products is outside the scope of this proceeding and cannot be a substitute for proper price formation.[154]

118. The SPP Market Monitor states that in past discussions with SPP staff regarding potential enhancements to the market optimization engine, it was advised that, given software processing limitations, separating pricing and dispatch into two different runs may require SPP to replace its real-time market power mitigation process with a look-ahead parallel mitigation process in order to keep the solve-time acceptable for SPP's five-minute dispatch. According to the SPP Market Monitor, this could lead to over/under-mitigation and improper price formation, which the SPP Market Monitor finds unacceptable.[155]

b. Reply Briefs

119. In their reply briefs, SPP and the SPP Market Monitor request that the Commission hold this proceeding in abeyance until after SPP has filed its Revision Requests.[156] SPP contends that the Revision Requests address pricing and commitment inefficiencies in SPP and therefore further many of the objectives identified in the December 2017 Order. SPP also states that deferring action in this proceeding would allow SPP to explore solutions to remaining design issues that are less disruptive than the

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[152] *Id.* at 24.

[153] SPP Initial Brief at 13-15.

[154] Golden Spread Initial Brief at 6-7.

[155] SPP Market Monitor Initial Brief at 14-16, 19-20.

[156] SPP Reply Brief at 2; SPP Market Monitor Reply Brief at 11.

changes identified in the December 2017 Order.[157] The SPP Market Monitor states that the Revision Requests can reduce uplift by leveraging SPP's 15-minute look-ahead tool to estimate whether or not commitment costs will be recovered. The SPP Market Monitor states that the look-ahead tool implements amortization of commitment costs in the commitment decision process, and that this design minimizes production cost while respecting physical parameters.[158]

120. Golden Spread contends that SPP's Revision Requests were not designed to address LMP concerns or price formation, but instead were intended to reduce the improper use of reliability unit commitments for quick-start resources as a way of modifying or suppressing prices. Golden Spread asserts that the Revision Requests will reduce reliability unit commitments and uplift but will not address underlying price formation and LMP transparency.[159] Additionally, Golden Spread states that sound price formation should not be confused with specific "product" development, which is outside of the scope of this proceeding and distinct from an LMP solution which drives SCED that includes the start-up and no-load costs of quick-start resources and allows those quick-start resources to set prices.[160]

c. Determination

121. We decline to hold this proceeding in abeyance to allow SPP to file its Revision Requests as a substitute for the quick-start pricing requirements discussed in this order. While the Revision Requests would add a one hour minimum run time requirement for quick-start resources, the Revision Requests do not appear to address the other specific practices the Commission finds unjust and unreasonable in this order. We do not make any findings regarding the Revision Requests since they have not been filed with the Commission. SPP may propose any such revisions to its Tariff in a separate FPA section 205 filing.

122. We disagree with the SPP Market Monitor's concern regarding a situation in which a quick-start resource is dispatched and setting price, but during the hour wind-powered production increases such that the quick-start resource would be dispatched below its minimum output or to zero megawatts, if not for its minimum run time. For a resource that is not needed, if its economic minimum is relaxed to zero it will then have

[157] SPP Reply Brief at 2-3, 7.

[158] SPP Market Monitor Reply Brief at 11.

[159] Golden Spread Reply Brief at 2-3.

[160] *Id.* at 6.

zero output in the pricing run. A resource at zero output will not be marginal and therefore will not set price.

123. We disagree with the SPP Market Monitor with respect to its concerns about potential effects on real-time mitigation and price formation that may result from our reforms. The pricing reforms we are currently directing will result in SPP having a pricing mechanism that is similar to the pricing mechanisms in other RTOs/ISOs, and we have no record of the kinds of mitigation or price formation issues suggested by the SPP Market Monitor. Further, we note that SPP acknowledges that it will be required to develop new pricing systems and software to implement the reforms required in this order, which may reasonably be expected to accommodate current real-time mitigation practices. Nonetheless, we expect the record in this proceeding will be supplemented when details on mitigation contained in the tariff revisions are filed on compliance.

124. We find that the other issues noted above, such as the development of a ramping product or other products, are beyond the scope of this FPA section 206 proceeding, which is limited to SPP's quick-start pricing practices.

The Commission orders:

(A) The Commission finds that SPP's existing quick-start pricing practices are unjust and unreasonable, as discussed in the body of this order.

(B) SPP is hereby directed to make a compliance filing by December 31, 2019, as discussed in the body of this order.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.

APPENDIX: List of Intervenors

Notices of Intervention

Arkansas Public Service Commission

Missouri Public Service Commission

Motions to Intervene

Ameren Services Company

American Electric Power Service Corporation

American Petroleum Institute

American Public Power Association

American Wind Energy Association

Arkansas Electric Cooperative Corporation

Basin Electric Power Cooperative

Black Hills Power, Inc.

City of Independence, Missouri

City Utilities of Springfield, Missouri

Cogentrix Energy Power Management, LLC

Dogwood Energy LLC

EDF Renewable Energy, Inc.

Edison Electric Institute

EDP Renewables North America LLC

Electric Power Supply Association

E.ON Climate & Renewables North America, LLC

Exelon Corporation

Golden Spread Electric Cooperative, Inc.

Invenergy LLC

Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company

Kansas Power Pool

LS Power Associates, L.P.

Mid-Kansas Electric Company, Inc.

Midwest Energy, Inc.

Missouri Joint Municipal Electric Utility Commission

Municipal Energy Agency of Nebraska

National Rural Electric Cooperative Association

Nebraska Public Power District

NextEra Energy Resources, LLC

Oklahoma Gas & Electric Company

Omaha Public Power District

Southern Company Services, Inc.

Southern Power Company

Southwest Power Pool, Inc.

Southwest Power Pool Market Monitoring Unit

Sunflower Electric Power Corporation

Tri-State Generation and Transmission Association, Inc.

Westar Energy, Inc.

Western Area Power Administration

Western Farmers Electric Cooperative

Xcel Energy Services Inc.

Out-of-Time Motions to Intervene

The Empire District Electric Company

Lincoln Electric System

Missouri River Energy Services