

Comments of Powerex Corp. on Energy Imbalance Market Transition Period Proposal

Submitted by	Company	Date Submitted
Mike Benn 604.891.6074	Powerex Corp.	December 31, 2014

Powerex appreciates the opportunity to comment on CAISO’s December 15, 2014 Draft Final Proposal for an EIM Transition Period. The brief history of the EIM indicates very significant initial implementation challenges that both CAISO and PacifiCorp did not anticipate. This is most evident in the frequent price spikes in both the PacifiCorp East and PacifiCorp West BAAs, and in both the Fifteen-Minute Market and the 5-minute Real Time Dispatch, as well as in the issuance of numerous emergency e-Tags sinking in the PacifiCorp BAAs since the EIM was launched.¹ Moreover, the implementation has been plagued by discrepancies between, and/or uncertainty regarding, the prices posted on OASIS, the prices used to determine dispatch, and the prices that will be used for settlement. These challenges have been compounded by extensive operational issues and pricing problems arising from the CAISO’s fifteen-minute market launched in May 2014 and the CAISO’s Full Network Model Expansion launched in October 2014. These significant challenges reflect that CAISO has undertaken three major market design initiatives in close succession. But, as discussed below, they also reflect that the EIM design does not require that participating BAAs be fully resource sufficient.

CAISO now proposes to extend, for a full year, the recent FERC-approved *temporary* waiver of certain constraint relaxation penalty prices in the calculation of LMPs within the PacifiCorp East and PacifiCorp West footprints, and in addition to make a 12-month penalty pricing waiver a standard part of its “initial EIM implementation” for any newly joining BAA. But whether or not such penalty prices should continue to be applied depends critically on the reasons for the underlying constraints being violated in the first place.

In these comments, Powerex first distinguishes between (1) information and data-related reasons that may cause the EIM software to erroneously trigger constraint relaxation; and (2) conditions in which EIM offers are genuinely insufficient to meet all of the intra-hour energy imbalance needs of the PacifiCorp BAAs. It may be defensible, for an interim period, to avoid applying penalty prices under the first condition, but it is wholly indefensible to do so under the second condition. Distinguishing between these two conditions requires transparent, complete, and credible information from CAISO and PacifiCorp, notwithstanding the significant pressure to declare the EIM a success and maximize the claimed benefits.

Powerex’s comments also address how EIM supply insufficiency can be addressed. The EIM’s “base schedule” framework and flexible ramping requirement were intended to ensure that each EIM BAA would have enough resources available for EIM dispatch to be able to meet imbalance energy needs. This approach does not appear to be working, and should be significantly strengthened. Increased *voluntary* participation—which appears to be CAISO’s and PacifiCorp’s primary focus—offers economic benefits

¹ There have also been significant problems in determining prices at certain CAISO scheduling points that are also locations in the EIM footprint (i.e., Cascade and Mona).

and should be encouraged. But the core task of ensuring EIM offers are sufficient to meet energy imbalance needs cannot be left to discretionary participation decisions in each hour. Each EIM entity BAA should be required to secure in advance the participation of sufficient resources to meet all of its intra-hour energy, capacity and flexibility needs. Simply hoping that voluntary offers will be enough to meet those needs—and suppressing market prices when they are not—will only prolong the fundamental resource sufficiency problems that the EIM has experienced to date.

CAISO has not Identified any Specific Reason for Prolonged Suspension of Constraint Relaxation Penalty Prices

On December 1, FERC granted CAISO’s request for a 90-day period in which it would set aside certain of its Tariff provisions governing how prices in the PacifiCorp EIM areas are determined, and permit retroactive refunds back to November 14, 2014 (the date of CAISO’s request). Specifically, CAISO sought a waiver from Section 27.4.3.2 and the second sentence of Section 27.4.3.4, which establish the price of energy in circumstances when the market cannot clear, or can do so only by violating a constraint. In support of its requested 90-day waiver, CAISO identified three circumstances affecting market outcomes, and represented to FERC that “it anticipates resolving the three circumstances identified within the 90 days.”² Moreover, CAISO explained that it “will be conducting a stakeholder process to determine whether additional measures are warranted for EIM Entities beyond the 90 day period. The CAISO would seek a tariff amendment in such cases and not further waivers.”³

Just fifteen days after FERC granted CAISO’s 90-day waiver, and without conducting the substantive stakeholder process it pledged, CAISO issued the Draft Final Proposal in which it backtracks from the representations it made to FERC in support of the 90-day waiver currently in effect. CAISO now takes the view that “an appropriate transition period is needed beyond the currently approved tariff waiver.”⁴ CAISO proposes to extend the application of the 90-day waiver to a full year, while adding a graduated offer cap (which is not in the current 90-day waiver). Moreover, CAISO proposes that the year-long waiver from applying constraint violation parameters and the imposition of offer caps become a permanent part of the EIM landscape, applicable to every new BAA that elects to participate in the EIM.

On stakeholder calls since EIM implementation, as well as during the December 18 meeting of the CAISO Board of Governors, CAISO emphasized that it has not identified any *specific* problem that it anticipates will remain unresolved at the expiration of the current 90-day waiver period. In Powerex’s view, it is inappropriate to suspend core portions of the Tariff’s LMP pricing provisions in the absence of a discrete and identifiable problem.

Powerex recognizes the significant challenges of implementing a new market, and is not opposed to maintaining appropriate customer safeguards as the market develops. For example, Powerex has previously suggested continuing to settle Schedule 4 and Schedule 9 imbalances using pre-EIM tariff rates. This could provide a transitional rate mechanism that protects PacifiCorp customers while the EIM develops. It would also appropriately shift the cost of EIM price spikes from PacifiCorp’s transmission customers onto PacifiCorp itself—the entity that is most able to address these price spikes both by addressing the data issues it is experiencing with the CAISO, and by taking additional steps to ensure it is fully resource sufficient in each of its BAAs.

² CAISO Petition for Limited Tariff Waiver and Request for Expedited Consideration (“Petition”) at 14.

³ *Id.*

⁴ Draft Final Proposal at 1.

Powerex also does not necessarily oppose consideration of other generic transitional safeguards, such as the Proposal's graduated bid cap; similar measures have been used in organized markets as a form of protection against the exercise of market power, which can be of particular concern during initial market implementation when participation is limited.

But Powerex does oppose discarding a core element of the LMP calculation methodology. Suspension of the penalty pricing mechanism will result in CAISO setting prices as if the market actually cleared supply and demand even if in fact it did not. For the same reason, Powerex opposes a built-in 12-month suspension of constraint relaxation penalty prices as a standard part of the EIM design for all future BAAs that elect to participate in the EIM. Suspension of these penalty prices should only be pursued if and when CAISO identifies a specific problem that makes application of those penalty prices inappropriate, and should be limited to the minimum amount of time necessary to address the identified circumstances.⁵

Constraint Relaxation Penalty Prices Should Apply if EIM Resources are Insufficient to Meet Imbalance Energy Needs

CAISO has identified two broad reasons for the EIM software requiring constraint relaxation: (1) the EIM software did not have accurate information regarding system conditions; and (2) there were insufficient resources available to be dispatched in the EIM to permit it to meet the energy imbalance needs. On stakeholder calls, CAISO and PacifiCorp have emphasized the role of "data problems" in giving the erroneous appearance of shortage. Powerex has no reason to doubt that communications and data issues have had some role in the observed implementation challenges. If these problems result in the EIM software having an inaccurate view either of the imbalance energy needs in an EIM BAA or of the available offer range from participating resources, then conceivably the EIM software may erroneously determine that it is incapable of clearing the market.⁶ In such cases, it may be appropriate to not apply constraint relaxation parameters, since doing so could indicate a shortage or infeasibility condition that might not actually exist. In such circumstances, Powerex does not oppose interim measures to ensure penalty prices are not erroneously applied, so long as CAISO and EIM entities are diligently pursuing solutions to those communication and data-related problems.

On the other hand, if resources offered in the EIM are, in fact, insufficient to meet the PacifiCorp imbalance energy needs, then it is entirely appropriate for EIM prices to reflect that lack of resource participation. That is the market design that CAISO developed and advocated to apply to the PacifiCorp BAAs in real-time. CAISO and PacifiCorp have long recognized that EIM participation would initially be limited only to PacifiCorp's own generating resources, and the specific PacifiCorp generating units that could participate in the EIM was known when CAISO and PacifiCorp determined the market was ready to "go live" on November 1. If the lack of participation is now regarded as so severe as to render the market unworkable under the approved Tariff provisions, then suspension of the market (rather than piecemeal suspension of selected market pricing provisions) is appropriate, as expressly contemplated under the Tariff. But if the CAISO elects to continue to operate the EIM, then it should continue to do so under the complete set of market rules that it designed and that FERC found to be just and reasonable. This specifically includes the Tariff provisions governing the use of constraint relaxation penalty prices to determine LMPs.

⁵ "Data problems," such as those experienced with PacifiCorp, can be proactively addressed for any new EIM entities prior to go-live; the proposed one-year transition period for every new EIM entity cannot be premised on PacifiCorp's experience with data and communication problems.

⁶ Arguably, however, the same data inaccuracy could understate imbalance energy needs or overstate the available offer range, yielding a market solution that does not, in fact, meet the actual imbalance energy needs. Such a scenario has not been addressed by CAISO or DMM.

Determining whether constraint relaxation is being triggered by data problems as opposed to genuine offer insufficiency is critical to whether or not the Proposal can be supported. While acknowledging the data communications problems described by CAISO and PacifiCorp, Powerex believes that the core problem facing EIM implementation is a genuine lack of sufficient supply to meet imbalances through the EIM market mechanism. In effect, the EIM footprint is **not** capacity and flexibility sufficient.

CAISO and DMM Reports Document Insufficient Resource Participation in the EIM

The informational report submitted to FERC by CAISO on December 15 indicates that “data errors” account for only a minority of the instances in which constraint penalty factors were used to determine LMPs. For instance, Figures 5 and 6 categorize instances of prices in excess of \$500/MWh in the PacifiCorp ELAPs in both the 15-minute and 5-minute markets, respectively. “Resource data alignment” accounts for only a small share of the total price spike frequency, as does “resource outage” which may also be plagued by data and communication issues. Other identified causes of price spikes include “Renewable deviation,” “Load changes,” and “Import/Export changes.” Significantly, CAISO’s report does not identify data-related issues as resulting in price spikes under these other categories. In other words, these latter categories of the causes of price spikes all appear to reflect genuine—rather than illusory—instances in which EIM offers were insufficient to meet imbalances in the PacifiCorp BAA(s) while still enforcing applicable constraints. In effect, these appear to illustrate that the PacifiCorp BAA(s) was capacity and/or flexibility *resource insufficient*.

The treatment of “Manual dispatches” requires particular attention. The CAISO describes these as instances in which the PacifiCorp grid operator manually dispatched non-participating resources or took “other out-of-market actions”, including “purchases of interchanges within the hour.” It is unclear why these actions occurred, and specifically if they were taken as a response to the lack of supply through the EIM. The PacifiCorp grid operator may issue manual dispatches for the deployment of contingency reserves for defined contingency events. It may also issue manual dispatches for changes to imbalance energy needs occurring *within* a 5-minute EIM dispatch interval. Both of these circumstances would be outside of the energy procurement that is intended to occur through the EIM.

If, however, the PacifiCorp grid operator is manually dispatching non-participating units in its BAA or making intra-hour import purchases for the purpose of meeting 5-minute imbalance energy needs (outside of a qualifying contingency event) then such actions overlap with the procurement of imbalance energy in the EIM. Such “parallel procurement” outside the EIM by the PacifiCorp grid operator is properly viewed as an operator intervention affecting the EIM. Both CAISO and its stakeholders should examine additional information regarding the circumstances under which the PacifiCorp grid operator is procuring intra-hour energy. It would be wholly improper to attempt to excuse price spikes as due to a lack of visibility regarding “manual dispatch” activity if the manual dispatches were taken *because* of an EIM shortage in the first place. To the extent any market intervention—whether by CAISO or by the PacifiCorp grid operator—helped “fill the gap” due to insufficient resource offers in the EIM, then EIM prices should reflect this insufficiency.

DMM’s December 18 report to FERC provided an alternative dissection of the causes of EIM price spikes. Figures 2.1 through 2.4 show the number of “constraint relaxation” events in each PacifiCorp BAA, and separately for the 15- and 5-minute markets, as well as the underlying cause of each event. The most common cause is identified as a “power balance shortage,” (capacity insufficiency) with the second most common cause being a “flexible ramping constraint violation” (flexibility insufficiency). Figure 4.5 also shows that, in the PacifiCorp East BAA, in virtually every day in November there was at least one instance in which *all* flexible resource bids in the EIM were fully exhausted. Simply put, DMM’s analysis concludes that the EIM frequently either lacked sufficient resource bids to clear the

market at a particular location (capacity insufficiency), or it lacked sufficient *flexible* resource bids to do so (flexibility insufficiency).⁷

Addressing EIM Resource Insufficiency Requires Additional Data to identify the Root Causes and Ensure the Efficacy of any Proposed Solutions

The above analyses by CAISO and DMM indicate that the EIM has experienced a chronic insufficiency of resource offers relative to the imbalance energy needs in the PacifiCorp BAAs. This was not supposed to happen. The CAISO EIM sought to ensure sufficient real-time resources by requiring (1) day-ahead and real-time balanced schedules specifying the forecasted energy resources sufficient to meet load schedules; (2) penalties for underscheduling load; and (3) a flexible ramping requirement of additional flexible resources offered into the EIM, intended to cover any unanticipated deviations between actual conditions and base schedules. This third requirement was intended to ensure that each EIM BAA was fully sufficient ahead of the operating hour from both a capacity and flexibility perspective.

Given the existing framework, EIM bid insufficiency may be due to one of three conditions:⁸

1. CAISO set a flexible ramping requirement that was too low for the actual imbalance conditions that were experienced. This would be the case in any interval in which $FRR < IE$, where FRR is the flexible ramping requirement and IE is the imbalance energy need in a PacifiCorp BAA.
2. CAISO's flexible ramping requirement was appropriate, but PacifiCorp failed to meet the requirement. This would be the case in any interval in which $Q_{offer} < IE \leq FRR$, where Q_{offer} is the quantity of resources that were offered into the EIM (and that were relied upon to meet the defined flexible ramping requirement).⁹
3. CAISO's flexible ramping requirement was appropriate and PacifiCorp satisfied it, but the resources that were offered (and relied upon to meet the defined requirement) failed to perform when dispatched. This could be the case in any interval in which $IE \leq FRR \leq Q_{offer}$, though additional information would be needed regarding performance of dispatched resources.

To identify the root cause of the underlying resource insufficiency, and to engage in an appropriate stakeholder process to identify effective solutions, CAISO should publish data on the imbalance energy and ramping needs in each BAA compared to the flexible ramping requirement and compared to the actual volume of offers in the EIM. The relevant comparison is not of the *average* values, however, but of the most severe values experienced in any hour. After all, resource sufficiency must exist in every interval in order to keep the lights on, not just on average. The adequacy of CAISO's rules can therefore only be meaningfully evaluated based on whether they ensure resource sufficiency under all conditions, especially the "outlier" conditions that are masked by averages.

⁷ Additionally, DMM documents a condition that was not addressed in CAISO's report, which is a "Power balance excess" that appears to be particularly common in the 5-minute market, and especially in the PacifiCorp West BAA.

⁸ As discussed above, there will be additional circumstances in which the EIM software erroneously fails to obtain a feasible market solution due to data or informational inaccuracies. This section addresses the circumstances that are not the result of data inaccuracy, but that are the result of a genuine failure to obtain a feasible solution given the resources actually offered into the EIM.

⁹ It is conceivable that more than one condition exists for a given interval. For example, the offers into the EIM may be less than the flexible ramping requirement *and* the flexible ramping requirement was also less than the actual imbalance energy or ramping needed.

There are other transmission providers in the WECC that currently provide information on system imbalances and the quantity of resources set aside to meet those imbalances. Bonneville Power Administration, for example, publishes near real-time information on the incremental and decremental balancing reserves it carries, as well as on the deployment of those reserves (*i.e.*, imbalance energy needs).¹⁰ This data is published on a 5-minute basis, with historic data available for download.

CAISO could greatly enhance transparency of its EIM processes and further the constructive dialogue in this stakeholder process by making available similar information. This information will permit stakeholders and CAISO to identify the root causes of resource insufficiency, and hence to identify the appropriate potential solutions. For example, if the flexible ramping requirement is less than the actual imbalance energy or ramping needs in a PacifiCorp BAA, then the solution is to increase the requirement.¹¹ As Powerex has previously pointed out, there are numerous reasons why the resources in the “base schedules” may not materialize, and yet CAISO’s flexible ramping requirement appears to be based on historical average ramping need rather than on a detailed assessment of the composition of the resource base schedules themselves for each respective hour. It may also be the case that the “diversity benefit” that reduces the flexible ramping requirement in the participating BAAs has been significantly overstated, or that the imbalance energy needs experienced in the PacifiCorp BAAs frequently differ materially from the historic levels of imbalances, making past outcomes an unreliable guide to current needs. The EIM flexible ramping requirements should be calculated in a manner that ensures, with a very high degree of certainty, that EIM offers will be sufficient to meet imbalance energy and ramping needs. This will ensure that PacifiCorp is required to be capacity and flexibility sufficient, which is essential to maintaining grid reliability and the proper functioning of the voluntary energy imbalance market.

Alternatively, if CAISO’s flexible ramping *requirement* has been sufficient for all actual imbalances to date, but PacifiCorp has failed to meet that requirement, or if resources meeting that requirement have failed to perform when needed, then measures to ensure compliance with CAISO’s requirements should be explored.

Additional Voluntary EIM Participation Is not a Substitute for a Robust Resource Sufficiency Requirement

To date, CAISO and PacifiCorp have appeared to focus primarily on increasing the participation of *voluntary* offers in the EIM. The voluntary nature of participation necessarily means that one must be prepared for resources to decide *not* to participate in the EIM in any given hour. Simply put, there must be sufficient resources participating in the EIM to meet imbalance energy needs *even if no additional voluntary resources participate*. Anything less is equivalent to the EIM Entity BAA deliberately “going short” into the EIM and speculating on actual imbalances not exhausting the availability of voluntary offers.

Such “leaning” on voluntary offers to meet a BAA’s capacity and flexibility needs creates at least three problems. First, it undermines reliability by deliberately leaving the system vulnerable if voluntary offers do not materialize as expected. Second, if and when actual imbalances fully exhaust all offers (voluntary and otherwise), keeping the lights on will require additional energy to be procured, often through

¹⁰ See <http://transmission.bpa.gov/Business/Operations/Wind/reserves.aspx>

¹¹ Powerex recognizes that increasing the flexible reserves carried in the PacifiCorp BAA(s) will likely reduce the flexible reserve cost savings that can be claimed from the EIM initiative. However, it is important to note that if the reduction in flexible reserves carried in the PacifiCorp BAA(s) merely results in the PacifiCorp BAA(s) leaning on voluntary energy offers to meet its capacity and flexibility needs, with associated increased reliability risk, then these cannot appropriately be viewed as efficiency benefits at all.

emergency actions by the PacifiCorp grid operator. As discussed previously, and extensively in recent FERC technical workshops, such operator interventions distort market prices and undermine the primacy of the EIM as the imbalance energy procurement mechanism for the PacifiCorp BAAs. Third, a failure to ensure resource sufficiency is especially problematic given CAISO's proposal that EIM prices not reflect resource shortages when they occur. The pricing elements of the Proposal could perhaps be acceptable if robust resource sufficiency measures were in place. But it is not appropriate to eliminate the pricing effects of resource shortages without implementing meaningful measures to ensure those shortages do not occur. To do so would be to condone a BAA "going short" the intra-hour reserves necessary to meet its capacity and flexibility needs, undermining reliability in the process, and then suppressing energy market prices when scarcity conditions inevitably occur.

Increased voluntary participation of resources in the EIM can provide economic benefits and should be encouraged. The benefit is due to the potential of a voluntarily-offered resource to offer energy at a lower price than is offered from the resources that were required to be available, thus reducing the cost of dispatched energy. Increased voluntary participation must not be pursued as a "solution" to having insufficient resources to maintain reliability in the first place, however.

Conclusion

The Proposal's "transition plan" appears to be a response that attempts to suppress symptoms without addressing the underlying problem: the EIM as implemented does not have the means to ensure sufficient resources will be offered to meet the actual imbalance needs in the PacifiCorp BAA. The Proposal describes measures CAISO and PacifiCorp will take to increase voluntary participation of resources in the EIM, but in the interim it seeks to suppress the penalty prices that would otherwise establish the LMPs when supply is insufficient. Powerex opposes this approach, as it seeks to suppress the symptom while doing little to address the underlying malady. Where a lack of EIM offers prevents the EIM from satisfying the imbalance energy needs in a BAA, the LMPs should reflect this fact.

The real solution is to ensure that EIM offers *are* sufficient to meet the energy imbalance needs in the first place. To permit a true evaluation of the scope and magnitude of resource insufficiency in the EIM, CAISO should conduct and publish a comprehensive analysis on the relationship between the maximum imbalance energy need in each hour (both capacity and ramping), the flexible ramping requirement for that hour, and the actual quantity of EIM offer range in that hour. This will provide significant insight into the prevalence and severity of resource insufficiency in the EIM, which in turn will indicate the most effective measures to address the problem. Ultimately, CAISO and PacifiCorp must be prepared to secure the participation of additional flexible resources so that PacifiCorp imbalance needs can be met through the EIM, as intended.