

# FERC Order 764 Comments

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Company	Date	Submitted By
Bonneville Power Administration	November 16, 2012	Edison Elizeh, BPA Strategy Integration
<b>Transmission Operations Comments</b>		
<p>1.1. In order to maintain system reliability, BPA will need to evaluate the operational implications of 15-minute scheduling on the COI. The outcome of this evaluation may result in constraints that limit the magnitude of MW changes available on the COI to manage system reliability (i.e. voltage swing, duration of the swing, DTC).</p> <p>1.2. Clarification requested on the curtailment process (as it is not addressed in the proposal):</p> <p>1.2.1. Is the CAISO planning on utilizing PDCI for the RTD market?</p> <p>1.2.2. As the CAISO considers how to manage curtailments and ramping protocols, BPA requests that it be in alignment with conversations with WECC and other stakeholders on the interties, including ones with firm transmission rights on adjacent transmission provider paths.</p>		
<b>CAISO Response</b>		
<p>1.1 In the previous dynamic transfers initiative, the ISO completed an analysis that concluded limits on dynamic transfers were not needed to maintain reliability. This analysis could presumably be interpreted to also apply to 15 minute schedule changes.</p> <p>1.2.1 No. PDCI is not controlled by the ISO.</p> <p>1.2.2 The ISO is participating in the WECC taskforce. The proposed market timeline honors all existing ramping and curtailment protocols.</p>		
<b>Scheduling Comments</b>		
<p>2.1. The Proposal indicates in section 4.3 that the “HASP transmission capacity award will be the hourly profile that needs to be tagged” (italic added):</p> <p>2.1.1.BPA requests clarification on if the CAISO will require e-Tags following the transmission award and in advance of the RTD award.</p> <p>2.1.2. BPA also requests clarification on whether “hourly transmission capacity” is a proxy for transmission reservations and is not referring to capacity tags. BPA assumes 15-minute awards will utilize normal e-Tags.</p> <p>2.1.3.Recommend that in order for the CAISO to consider a 15-minute bid, the participant needs to ensure deliverability.</p> <p>2.1.4. There needs to be coordination on how bids are accepted and how transmission reservations are scheduled and tagged.</p>		
<b>CAISO Response</b>		
<p>2.1.1 Final tags for hourly transmission and hourly energy schedules must be received at T-20 before the scheduling hour. For changes based upon RTPD schedules, the energy schedule must be tagged at T-20 before the 15 minute interval.</p> <p>2.1.2 Both hourly and 15-minute awards will use normal energy e-tags.</p>		

2.1.3 Market participants will be required to tag their 15-minute schedules after the RTPD clears. Failure to deliver a 15-minute award will result in energy settled at the RTD price (although the ISO is considering different settlement provisions for undelivered energy) .

2.1.4 Agree

### **Market Design Comments**

- 3.1. Clarification requested on what is qualified as an operational change and how operational changes are managed/validated.
- 3.2. At the T-75 deadline, can a party bid in a shaped hourly energy profile with separate 15-minute bid profiles consisting of different 15-minute energy and price parameters or must the hourly bid be uniform across the hour (price and quantity)?
- 3.3. At the T-75 deadline, can parties submit multiple hourly bids with different hourly energy and price profiles?
- 3.4. If a party procures HASP transmission capacity, yet are not awarded energy, and the transmission is used by another dispatched party, the party who purchased the transmission should be compensated.
- 3.5. Regarding HASP transmission capacity, do parties that procure this transmission receive priority in CAISO market?
- 3.6. Will the CAISO have a mechanism to determine in advance of a clearing for the 15-minute interval who is a price taker due to their inability to adjust? How will these static tags and their bid price effect the individual 15-minute dispatch price intervals?
- 3.7. In section 4.4.2-- 15-minute Market and RTD the ISO states that the intertie resources are scheduled economically and are eligible for bid cost recovery in the event the schedule is inconsistent with its bid price, does this apply to both imports and exports? Does this also apply to both non-dynamic and dynamic intertie resources?

### **CAISO Response**

3.1 A generator or transmission outage/de-rate known prior to the start of the market optimization for the relevant 15-minute RTPD interval. The ISO is considering additional measures to validate that changes are based upon physical changes in the resource.

3.2 No, the hourly bid must be uniform across the hour.

3.3 Yes, just as under the current market design, market participants would be able to submit separate bids for each resource ID they have registered at an intertie.

3.4 Transmission reservation capacity (TR) will be "use it or lose it". However, an Energy schedule in the opposite direction of intertie congestion will be paid from the TR in the direction of congestion commensurate with delivery obligation.

3.5 The TR will shield the import for changes in the import ITC shadow cost in the next market. TR shields an export for changes in the export ITC shadow cost in the next market. Furthermore, Energy self-schedules under a TR will have a higher scheduling priority than Energy self-schedules without a TR.

3.6 Yes. In the hourly transmission process an SC can flag an import or export as an hourly block schedule. If an SC submitted an economic bid to be used in the hourly transmission process, the flag would self schedule in each 15-minute interval a MW quantity equal to the HASP advisory energy schedule, which will be constrained in HASP to be equal across all HASP 15-min intervals. These self-schedules could potentially affect the prices in the 15-minute intervals in the same manner that self-schedules affect intertie prices in the current market design.

3.7 Currently bid cost recovery only applies to imports, but not export. Yes, bid cost recovery does apply to both non-dynamic and dynamic intertie resources.

Company	Date	Submitted By
Calpine	November 19, 2012	Mark Smith
<b>The Intent of 764 is Frustrated if LMPs Fail to Represent Market Conditions</b>		
<p>Order 764 was issued in large part to ensure the efficient integration of variable renewable resources. Such integration will be managed most efficiently if prices, especially in the real time market, represent the true cost of the marginal resource on the grid. Unfortunately, with the growing use of Exceptional Dispatch, RT LMPs rarely reflect the true cost of marginal energy. Rather, as the Commission noted in an Order issued on October 26, 2012, the use of Exceptional Dispatch may be “too expansive” and may “tend to artificially depress market clearing prices.”</p>		
<p>In addition, an overly-conservative, or inappropriate approach to placing units at Minimum Load also injects unpriced energy into the supply stack and reduces prices. As an example, the CAISO recently announced a new MOC constraint in Northern California that expressly protects the CAISO grid from a transmission contingency. The CAISO will apparently commit units to provide ramping capability to be used in a post-contingency response. These minimum commitments will not be allowed to set the LMP, and hence, will further suppress market prices.</p>		
<p>Given these market imperfections and the dramatic increases in variable resources, it is often unlikely that LMPs reflect the true marginal signals to increase or decrease output. This will only lead to more Exceptional Dispatch.</p>		
<p>So, Calpine fully concurs with the Commission, when it said the following in its October 26 Order:</p>		
<p>We strongly encourage the CAISO to continue evaluating, through its stakeholder process, new market products, including but not limited to, a 30-minute ramping reserve service that may reduce the CAISO’s reliance on exceptional dispatches.</p>		
<p>There seems to be no better forum to address these fundamental market infirmities than a comprehensive redesign of the RT market. Calpine asks that the CAISO address the beneficial or detrimental effects of the instant proposal with respect to the use of ExD and MOC and include in this redesign pricing modifications that recognize the impact of these out of market dispatches.</p>		
<b>CAISO Response</b>		

The ISO will address these issues in separate stakeholder initiatives.

#### **15-minute Intertie Scheduling Works IF Others Allow It**

As indicated in the Summary, much of the benefit of the contemplated changes only accrue to market participants if more flexible transactions are available at the interties. That is, 15 minute scheduling at the interties only works if the external BAA allows schedule changes within the hour. While there is some movement to more frequent scheduling timelines, particularly in the Pacific Northwest, these efforts remain in pilot status, and no such activity appears to be occurring in the Desert Southwest or Rocky Mountain regions. If other Regional entities seek less dramatic forms of compliance with Order 764, much of contemplated effort would be fruitless.

The CAISO should consult with and report back on external BAA compliance approaches. This feedback would be instructive to determine how far to go with this proposal and also how fast to go there. Indeed, if resistance to this change to 15 minute intertie scheduling is substantial in the interconnection, a more moderated focus on optional services and redeployed focus on correcting current imperfections might be a more reasoned approach.

#### **CAISO Response**

The ISO is coordinating with the WECC and is also assessing its import supply relative to other BAAs and their anticipated scheduling practice changes in conjunction with Order 764. The ISO agrees that if more BAA utilize 15 minute schedule, then the 15 minute market will be more liquid.

#### **Simultaneous Clearing is Beneficial**

Calpine's has long-held the position that a simultaneous RT clearing of interties, virtuals, internal generation and load would be a preferred outcome for CAISO markets. Current markets that allow interties to clear on hourly blocks create a market in which internal generation cannot participate because they must settle every 10 minutes. This sequential market clearing has also produced inefficient dispatch of both intertie and internal generation – and has resulted in alleged systemic price differences. Of course, this sequential clearing problem also may lie at the heart of intertie convergence bidding controversy.

However, our support for simultaneous clearing is conceptual and the CAISO should not interpret this as an endorsement of 15 minute scheduling at any cost. As a substantial contributor to the CAISO's flow-based GMC, Calpine seeks, below, a better understanding of the costs of this change and any reasonable compliance alternatives.

#### **CAISO Response**

The ISO agrees that market and system changes should be justified by the costs. The benefits of this change can be estimated at a high level by examining past the uplift charges under the HASP market design that would be eliminated or at least reduced under the ISO's proposal. The ISO does not currently have a detailed estimate of the implementation costs for its proposed changes but anticipates they will not be excessive as our proposal uses existing or planned market functionality to the extent possible to minimize the implementation costs.

#### **Four Settlements Every 15 Minutes Is Overkill**

The proposal creates 4 settlements covering every 15 minutes for internal generation. First, the newly reconstituted RTPD creates a 15 minute financially binding settlement for internal generation. This

settlement does not create a physical obligation for energy, but is, in form and structure, similar to the DA IFM financial clearing. A few short minutes later, the generator will be given financially and physically binding dispatch instructions. These dispatch instruction would be settled on a 5-minute basis – as opposed to the current 10 minute settlement interval.

This multi-settlement mechanism is a vestige of driving to a simultaneous clearing market at 15 minutes. However, the settlement, validation, and shadowing costs will be substantial. Calpine believes that any and all alternatives to this 4-settlements-every-15 minutes should be considered.

#### **CAISO Response**

The ISO is evaluating options to minimize design complexity.

#### **A Slowdown in FRP Should Defer Dec Floor Changes**

The current timeline defers the implementation of FRP until fall of 2014. Most relevantly, the deferral of FRP leaves the CAISO with no downward ramping product or constraint. Recall that the upward ramping constraint was implemented in December of 2011. The upward ramping constraint (FRC) was placed in service for two purposes, first to address alleged reliability concerns, but also to address the price impacts of Power Balance violations. These Power Balance violations occur when there is insufficient upward ramping capability and the penalty price of \$1000 is imposed.

Data indicate that the downward ramping Power Balance violations are much more frequent than upward violations. These downward violations currently peg the supply price at \$-30. A downward ramping product (or compensated constraint) would tend to insulate supply from the same reliability and price impacts as the upward constraint has accomplished. However, with this proposal, the ISO may delay substantially that supplier protection.

Compounding the harm of delay will be the proposed (not filed) reduction to the decremental energy bid floor. This change (from \$-30 to \$-150) will set the new low bar for Power Balance violations and will expose internal generation to unavoidable and deeply negative prices. Should the CAISO defer or delay implementation of FRP, it should also delay the implementation of the dec bid floor reduction. Doing so would be a demonstration of the CAISO's equal and unbiased concern for undue price impacts – whether they affect load or supply.

#### **CAISO Response**

The ISO does not plan any changes in the timing of the first set of lowering the bid floor to -\$150 when BCR is will be paid separately for the DA and RT markets. This bid cost recovery change should protect generators from negative prices as long as they are following dispatch instructions. The further reduction to -\$300 is aligned with proposed FRP implementation in Fall 2014.

#### **What is the Cost-Benefit Ratio of the Big Bang**

The ISO's proposal is comprehensive, and would substantially change RT operations modeling, information requirements, interfaces and back office functions. As a substantial contributor to the CAISO's flow-based GMC, we ask to see cost estimates of the ISO's instant proposal and alternative forms of compliance with Order 764.

In addition, we would like to see a specific quantification of the benefits of this big-bang approach to compliance.

**CAISO Response**

See response above.

**Focusing on Technical Design Matters Seems Premature**

While there are many, many technical issues with the instant proposal to be explored and discussed (some of which have been submitted by WPTF), Calpine has not focused on implementation issues. We propose that the ISO consider alternative forms of compliance rather than focus solely on the instant proposal. Such alternatives, along with cost estimates, should be developed sufficiently to present to the Board for consideration.

**CAISO Response:**

The ISO is proposing to make changes to the real-time market that address FERC Order 764 compliance, excessive real-time market uplifts, and convergence bidding on the interties. The introduction of 15-minute scheduling provides the opportunity to make market design changes that can address many of the real-time issues that previous stakeholder initiatives have been unable to resolve.

Company	Date	Submitted By
Center for Energy Efficiency and Renewable Technologies	November 16, 2012	David Miller <a href="mailto:david@ceert.org">david@ceert.org</a> 916-340-2638
<p>A WECC-wide 15-minute transmission reservation market would provide enormous benefits for integrating increasing amounts of Variable Energy Resources (VERs) and for overall system operations and we commend the CAISO for their leadership in this direction. Shorter scheduling intervals allow the system operator to more efficiently utilize balancing resources and ancillary services, which directly translates to significant ratepayer savings. The Renewable Northwest Project (RNP), a not-for-profit advocacy group located in the Pacific Northwest, estimates that if all of the wind scheduled from the Northwest to California was done on a 15- minute basis, California consumers would decrease their exposure to BPA’s wind integration rate by approximately \$15 million per year. This is a significant savings that could be passed directly through to California ratepayers.</p> <p>Equally as important, the ability to schedule energy closer to flow reduces VER forecast error. This reduced forecast error enables the system operator to more efficiently utilize balancing resources, resulting in the potential for significant ratepayer savings. This current CAISO proposal moves from the existing practice of scheduling energy for hourly intervals at 90 minutes before flow to scheduling energy for 15 minute intervals at 37.5 minutes before flow, and therefore represents a significantly reduced forecast error, improved granularity for following ramps, and increased efficiency at reserving and scheduling ancillary services. Such an approach may result in significant ratepayer savings. Furthermore, if and when WECC moves to 15-minute transmission reservations and shorter e-tag timelines in the future, the CAISO has suggested that it would be open to further modifying its timeline to run the 15-minute market closer to actual flow. CEERT commends the CAISO for developing an</p>		

approach that will not only reap immediate benefits to system operational efficiencies, but that also provides a mechanism for continuing to improve scheduling practices if and when WECC is able to develop a 15-minute transmission market. Still, despite our overall satisfaction with this general approach, CEERT is still curious as to how MISO is able to offer Dispatchable Intermittent Resources (DIRs) the ability to update financially binding energy schedules 10 minutes prior to flow.

Our only significant concern with the current proposal is that CAISO has suggested completely eliminating the Participating Intermittent Renewable Program (PIRP). While we also have significant reservations with PIRP, it still offers financial protection to VERs due to the pricing fluctuations between hour ahead and real time energy prices. This protection has been offered to VERs because for these resources it is not possible to know the availability of the fuel source in advance of flow. And while moving to 15-minute energy schedules that are bid 37.5 minutes prior to flow is an improvement over the current scheduling practice, this still leaves a potentially significant financial exposure due to the physical limitations of these resources that are outside the control of the resource scheduling coordinator. Furthermore, convergence bidding, which can provide a hedging mechanism between price fluctuations between day ahead and real time markets, will presumably not be available to VERs to hedge against fluctuations between the 15-minute scheduling process and Real Time Dispatch. Therefore VERs are exposed to a financial risk that is simply not faced by conventional resources, leading to the possibility of an uneven playing field. Because of this, CEERT would like to see the CAISO take a more cautious approach to completely eliminating PIRP until the actual magnitude of this exposure can be studied under the new proposed 15 minute market.

The importance of FERC Order 764 compliance cannot be overstated when it comes to developing efficient market practices that aid in the integration of VERs. The elegant approach being proposed by the CAISO will offer immediate benefits to California ratepayers while interfacing with existing WECC markets, and will also provide the opportunity for increased efficiencies if and when WECC moves to 15-minute transmission reservations and shorter e-tag timelines. We commend the CAISO for developing a proposal that exceeds the necessary FERC Order 764 compliance, and hope that their approach and the ease with which it interfaces into the existing WECC market will provide the incentive for WECC to also take a more proactive approach.

**CAISO Response**

The ability to schedule at 37.5 minute prior to flow, and to update in 15 min intervals for the 15 minute market, and to update each 5 minutes in RTD, will substantially limit the risk that VERs are exposed to, consistent with the intent of the VERs order. This is a substantial change compared to the current 90 minute lead time and hourly granularity for forecasts of expected energy formed the basis for PIRP.

Company	Date	Submitted By
Citigroup Energy Inc (CEI)	November 16, 2012	Eric Goff, CEI
<b>Potential Issues With CAISO's Proposal</b>		
<p>CAISO's proposal is not yet clear in its implementation. However, it appears that the approach will create unnecessary price risk on intertie transactions between CAISO and areas that do not have similar settlement arrangements. Importers and exporters into CAISO will have price and volume risk in CAISO that cannot be adequately hedged, even with the proposed transmission transactions.</p> <p>Price and volume risk seems to be created by this proposal. In particular, an hourly schedule in another</p>		

balancing authority cannot be offset in California. The 15-minute settlement proposed by CAISO will merely add unnecessary risk without any clear benefit.

The proposed transmission hedging mechanism is inadequate. By only refunding congestion costs, and not settling like a CRR, it will create the potential for arbitrages that may not have a clear economic benefit. The proposed settlement will lead to uplift, again without any clear benefit.

Finally, The two-minute window to update schedules will inevitably create unforced errors without any clearly demonstrated benefit. It is not an appropriate mechanism to have reliably functioning commercial operations. CEI urges CAISO to have a proposal that does not rely on a mechanism such as this one.

#### **CAISO Response**

The current HASP process has led to significant market uplift costs. The ISO believes that the price risks highlighted by Citigroup increase the benefit to neighboring BAA of offering 15 minute scheduling because only 15-minute schedules will have price certainty in the ISO. Understanding that it is possible that there is an hourly schedule in another balancing authority correlating to an intertie schedule participating in CAISO market, CAISO believes that 15-minute scheduling is the direction all balanced authority areas should logically go based on FERC order 764. CAISO believes that, for hourly block schedules, allowing the HASP advisory schedule to be protected on 15-minute base and settle the schedule on 15-minute prices is the best trade-off to satisfy FERC order 764.

The 2.5 minutes balances honoring the 20 minute e-tag deadline and starting/completing the 15 minute market optimization as close as possible to actual flow.

Regarding the risk, ISO's 15 minute settlement is aimed to eliminate the existing inconsistency between the inter-tie settled on HASP hourly and internal resources settled on RTD 5-minute base. It will also provide all resources with a consistent market to compete. While hourly price guarantees may reduce risk for suppliers, this "insurance" is not without costs and is currently paid for by load.

#### **Questions about the CAISO Proposal**

How will the CAISO proposal interact with USF mitigation? If USF continues to be evaluated on an hourly basis, it could lead to conflicts with CAISO 15-minute scheduling and settlement. How does CAISO propose to resolve these conflicts?

#### **CAISO Response**

This would be a physical curtailment and hourly block schedule would be allowed to update the 15 minute market self schedule.

If the 15-minute self-schedule change is known prior to the start of the binding 15-minute market optimization (37.5 minutes prior to flow), the self-schedule would reflect the curtailment and there would be no deviation settled at the RTD price.

#### **Alternative Approaches**

CAISO could ensure that resources (including variable energy resources) have the opportunity to update schedules on a fifteen-minute basis, and end its compliance with FERC Order 764 there. Then, it can

work on a longer time frame to develop 15-minute settlement on a separate path. There is no obligation for CAISO to develop a proposal like this one concurrently with FERC Order 764 compliance. CEI urges CAISO to take this alternate path

**CAISO Comment**

The ISO believes that this would insufficiently address market inefficiencies resulting from the current HASP settlement. For example, the ISO’s 15-minute market proposal will likely allow for reinstating convergence bidding at the interties. The ISO and stakeholders recently engaged in a stakeholder process to develop a way to reinstate convergence bidding at the interties under the HASP market design. All of the solutions that were identified had the potential to result in significant market inefficiencies or operational concerns.

Company	Date	Submitted By
DC Energy	November 9, 2012	Seth Cochran, cochran@dc-energy.com, 512-971-8767

DC Energy appreciates the opportunity to comment on the CAISO straw proposal for 15-minute Intertie Pricing and Order 764 compliance. We believe the market structure enhancements necessary for the reinstatement of convergence bidding at the interties need to proceed without delay in order to meet the proposed Spring 2014 implementation.

In general, DC Energy is supportive of the CAISO’s 15minute Intertie Pricing Proposal as conveyed in the October 23rd white paper. Most notably, we support the creation of the proposed 15-minute market and the alignment of energy settlement for both intertie convergence bids and internal nodes, which would correct the issues that led to increased real-time imbalance energy offset contributions. At the same time, we recognize there are numerous fundamental design questions and requests for clarifications that were raised at the October 30th stakeholder meeting, which need answered. As such, DC Energy encourages the CAISO to provide detailed responses to these questions and post them as a single document for the benefit of all market participants. Specifically, DC Energy is interested in the treatment of unused transmission capacity procured in the Hour Ahead Settlement Process and if it is appropriate for it to receive its value in real-time.

DC Energy notes that the proposal would incentivize Variable Energy Resources (VERs) to self-schedule rather than submit economic bids that could set price and be part of the dispatch. For future market design enhancements we encourage the CAISO to consider ways to more fully integrate them into the market and reduce the reliance on self-schedules.

Lastly, DC Energy continues to support the proposal to only enforce the physical plus virtual intertie constraints coupled with limitations on e-tags. The solution is straightforward and would resolve the dual constraints issues without a large market re-design.

**CAISO Response**

Day-ahead, HASP, and 15-minute TR is “use it or lose it”. The ISO has posted an excel workbook that

illustrates the settlement.

The ISO is considering the limitations on e-tags based upon RUC schedules.

Company	Date	Submitted By
Department of Market Monitoring	November 9, 2012	
<b>Exempting 15-minute tie schedules from 15-minute ITC congestion price</b>		
<p>Exempting 15-minute tie schedules with HASP transmission reservations from the 15-minute intertie (ITC) congestion price may cause significant uplift from real-time congestion offsets. Intertie virtual schedules will exacerbate this uplift while providing little to no market efficiency benefits. DMM does not support exempting 15-minute tie schedules with transmission reservations from the 15-minute ITC congestion price. Furthermore, DMM opposes intertie virtual bids under such a pricing scheme.</p>		
<p>Exempting 15-minute tie schedules with HASP transmission reservations from the 15-minute ITC congestion price may cause significant real-time congestion offset uplift. Uplift will occur when:</p> <ol style="list-style-type: none"><li data-bbox="240 800 1328 835">1. The 15-minute import ITC shadow price exceeds the HASP import ITC shadow price; and</li><li data-bbox="240 835 1386 905">2. Imports with transmission reservations displace day-ahead physical or virtual imports (or net against 15-minute export schedules) that settle on the full 15-minute LMP.</li></ol>		
<p>The 15-minute market pays import schedules that have HASP reservations the scheduling point's 15-minute market LMP, without subtracting the 15-minute market import ITC shadow price. On the other hand, day-ahead physical or virtual imports that buy back their day-ahead positions in the 15-minute market pay the full 15-minute LMP. The price paid by these transactions to the 15-minute market is less than the price paid to each import schedule with a HASP reservation in the 15-minute market. The difference in price is precisely the 15-minute import ITC shadow price. Therefore, for every 15-minute import schedule with a HASP reservation that displaces a day-ahead physical or virtual import, the real-time uplift account accumulates a charge equal to the 15-minute ITC shadow price.</p>		
<p>The 15-minute market import schedules have to pay the HASP import ITC shadow price in order to get their HASP transmission reservations. This credits the real-time uplift account. However, when the HASP import ITC shadow price is less than the 15-minute import ITC shadow price, the credit from the transmission reservation payments will be less than the charges caused by exempting these schedules from the 15-minute market ITC shadow price.</p>		
<p>Therefore, the proposed shadow price exemption policy will cause real-time imbalance offset charges to the extent that 15-minute import ITC congestion prices exceed HASP ITC congestion prices. This result is anticipated, since generally speaking we have observed increasing shadow prices on transmission constraints as we move from the less ramp-constrained day-ahead market to the more ramp-constrained 5-minute RTD market. DMM highlights this issue so that the anticipated increase in real-time revenue imbalance can be explicitly considered in the development of this market design enhancement. An alternative that can mitigate this uplift is to settle all injections and withdrawals in the 15-minute market at each node's full LMP.</p>		
<p>If the ISO proceeds with the proposed shadow price exemption policy, intertie virtual schedules could cause or exacerbate the uplift described above while providing little to no market efficiency benefits. DMM has provided arguments and evidence elsewhere that intertie virtual bids provide little to no</p>		

market efficiency benefits under the existing design<sup>1</sup>. Meanwhile, intertie virtual supply would exacerbate uplift at interties with 15-minute import ITC congestion because every MWh of virtual supply at such a tie is displaced by a 15-minute import schedule. Therefore, when the 15-minute ITC shadow price exceeds the HASP shadow price, every MWh of virtual supply at the tie directly creates real-time uplift equal to the difference in the shadow prices. Moreover, the ISO's proposal allows imports to increase their self-scheduled 15-minute import quantity to meet or exceed their HASP reservation quantity. Under this proposal, virtual supply could be used strategically to cause the 15-minute ITC shadow price to exceed the HASP ITC shadow price and profit from this difference. As a result, DMM opposes intertie virtual bids under a pricing design that exempts 15-minute market tie schedules from the 15-minute ITC shadow price.

<sup>1</sup> See DMM's comments on the Intertie Pricing and Settlements stakeholder initiative Third Revised Straw Proposal at <http://www.caiso.com/Documents/DMM-Comments-IntertiePricingSettlementThirdRevisedStrawProposal.pdf>

### **CAISO Response**

The ISO recognizes that settling the transmission reservation will result in market uplifts. The transmission reservation process was established based upon stakeholder input in the Dynamic Transfer initiative and has been approved by the BOG. Uplifts should be reduced however because only differences between the ITC shadow cost will result in uplifts versus the full LMP. The ISO will work with stakeholders to identify ways to reduce the market inefficiencies from the transmission reservation process.

While uplift will remain, the primary uplift driver from convergence bidding on the interties will be reduced since both virtual demand and virtual supply settle at the RTPD price.

### **Incentives for internal generation to deviate from dispatch**

The proposed two-settlement real-time market structure potentially creates several new incentives for internal generation resources to deviate from their 5-minute dispatch instructions. The deviation incentives are not related to inflating BCR or RIE. A mechanism that provides incentives to follow dispatch instructions, such as an uninstructed deviation penalty or similar instrument, implemented at the same time as the proposed 15-minute market may prevent this inefficiency.

The proposed 2 real-time market structure creates several new incentives for internal generation resources to deviate from their 5-minute dispatch instructions. These deviation incentives are not related to inflating BCR or RIE.

First, internal resources may have the incentive to deviate from their 5-minute dispatch instruction in order to protect their profits in the 15-minute market from being eroded by revenue shortfalls in the 5-minute market. If a resource follows its 5-minute market dispatch instruction away from its 15-minute market schedule, spurious 5-minute market LMPs may create a revenue shortfall for the energy settled in the 5-minute market. This shortfall would net against the resource's profits from its 15-minute market schedules. Risk-averse resources content with their profits from the 15-minute market have incentives to deviate from the 5-minute dispatch instructions in order to operate at their 15-minute schedules and avoid exposure to 5-minute market prices.

Resources may also have the incentive to deviate from dispatch instructions in order to profit from expected price differences between the 15-minute and 5-minute market LMPs, or to force their real-time output to settle on the 5-minute market prices rather than the 15-minute market prices. The disparity between a resource's telemetered output and its schedule is considerably larger in the proposed 15-minute market than in the 5-minute market. A resource could utilize this fact to expose the difference in its 15-minute and 5-minute market schedules to the difference between the 15-minute and 5-minute market LMPs. The resource could profit from expected differences between the markets' prices by submitting high real-time bids and deviating in order to operate at its day-ahead schedule.

Similarly, a resource that expected the 5-minute market prices to systematically exceed the 15-minute market prices may be able to force a significant portion of its real-time output to settle on the 5-minute market price by deviating to stay above its day-ahead schedule.

The incentives to deviate described in these comments are not related to inflating BCR or RIE. DMM believes the mitigation measures proposed in the BCR Mitigation Measures stakeholder initiative may not be effective in removing these new incentives to deviate. Other incentives to follow dispatch instructions when the 15-minute market is implemented may be warranted, such as an uninstructed deviation penalty, in order to mitigate this specific incentive to deviate, as well as to further mitigate incentives to deviate in order to inflate BCR or RIE.<sup>2</sup>

<sup>2</sup>See DMM's comments on the Second Revised Draft Final Proposal for the BCR Mitigation Measures stakeholder initiative for our concerns over gaps in the ISO's proposed measures to eliminate incentives to deviate in order to inflate BCR and RIE: <http://www.caiso.com/Documents/DMM-Comments-BidCostRecoveryMitigationMeasuresSecondRevisedDraftFinalProposal.pdf>

#### **CAISO Response**

The ISO believes that this discussion should more broadly consider the need to implement an uninstructed deviation penalty for all resources. If determined, the uninstructed deviation penalty will need to consider the deviation from the 15-minute schedule versus deviation from the 5-minute schedule due to this change. This initiative will address how to settle deviations.

#### **Settling un-tagged tie schedules on 5-minute market prices**

Predictable price differences between the 15- and 5-minute markets would create profit incentives for imports or exports to systematically not tag their 15-minute schedules. DMM recommends settling un-tagged 15-minute tie schedules on the least profitable of each schedule's 15-minute or average 5-minute LMP.

If the ISO settles un-tagged tie schedules on the 5-minute market price, predictable price differences between the 15- and 5-minute markets would create profit incentives for imports or exports to systematically not tag their 15-minute schedules. Power marketers that expected the 15-minute market prices to exceed the 5-minute market prices could profit from this expected price difference by not tagging imports they scheduled in the 15-minute market. Similarly, power marketers that expected the 5-minute market prices to exceed the 15-minute market prices could profit from this expected price difference by not tagging exports they scheduled in the 15-minute market.

One alternative for mitigating the incentive to not tag intertie schedules is to settle untagged 15-minute market imports on the higher of the 15-minute market and 5-minute market prices. Similarly, un-tagged 15-minute market exports could be settled on the lower of the 15-minute and 5-minute market prices.

Stated differently, this strategy can be mitigated by settling un-tagged 15-minute intertie schedules on the least profitable of each schedule's 15-minute or average 5-minute LMP.

**CAISO Response**

The ISO is considering the "worse of" settlement rule, but in the context of a broader treatment of all uninstructed deviations under the new 15 minute market design.

Company	Date	Submitted By
Large-Scale Solar Association (LSA)	November 16, 2012	
<b>LSA support for overall CAISO approach</b>		
<p>LSA supports the CAISO’s overall approach to addressing the Order, i.e.: (1) focusing on the 15-minute scheduling provisions; (2) using existing and already-planned software functionality where possible; and (3) deferring implementation of the Flexible Ramping Product (FRP) until after these provisions are in place.</p> <p>LSA has strongly supported implementation of the Order 764 requirements for 15-minute scheduling before any implementation of the FRP framework, and we are gratified to see that the CAISO has adopted this sensible sequencing. This revised approach will avoid the need for the cumbersome and problematic submittal of “profiles,” potentially unrelated to energy schedules, for FRP cost allocation under the CAISO’s latest FRP proposal.</p> <p>Likewise, the CAISO’s plan to use existing software capability is sensible, at least for the initial Order implementation. (However, as noted below, LSA believes that some changes would be warranted, soon after implementation if they are not feasible concurrent with it.)</p> <p>LSA also agrees with the CAISO that the VER meteorological-data and outage information provisions are already in compliance with the requirements in the Order (and very likely exceed them). Thus, this initiative can focus on the 15-minute scheduling requirements.</p>		
<b>CAISO Response</b>		
No comment.		
<b>Elimination of PIRP</b>		
<p>Elimination of the Participating Intermittent Resource Program (PIRP), without: (1) a CAISO demonstration that the proposed 37.5-minute advance schedule submission will sufficiently mitigate imbalance-energy risk to warrant that step; or (2) consideration of adequate grandfathering and/or transitional mechanisms.</p> <p>LSA agrees (and has stated before) that, in general, more granular scheduling and settlement provisions, and schedule submission closer to real time, should reduce or eliminate the need for PIRP. However, it is not clear without further analysis that reducing the schedule-submission deadline from 75 minutes to 37.5 minutes, and allowing 15-minute schedule changes in real time, will mitigate VER imbalance risks sufficiently to remove that significant protective element. The CAISO should make that demonstration to support its proposal, instead of basing this element on its opinion.</p> <p>In addition, the latest version of the Stakeholder Initiatives Catalog combines the “Transition Out of PIRP” initiative with this initiative, yet the Proposal contains no transitional mechanisms at all. LSA suggests incorporating the following mechanisms into the Proposal:</p> <ul style="list-style-type: none"> <li>Grandfathering mechanism: The CAISO dismissed consideration of such a mechanism at the Meeting, then stated that it might consider one if “all stakeholders” agreed to “bear the burden” that might result. The CAISO has incorporated grandfathering mechanisms in several market-design changes – e.g., Standard Capacity Product II and the PIRP Export Fee – without agreement of “all stakeholders.”</li> </ul>		

The issue here should be whether such a provision would be just and reasonable, and LSA believes that it would. A reasonable grandfathering provision would avoid both:

- Financial issues, e.g., where the imbalance protection is needed by the scheduling party in a transaction, such as the supplier, and its removal would cause undue hardship; and
- Contractual issues, e.g., common PPA provisions requiring: (1) PIRP participation by suppliers and/or compliance with PIRP provisions; and (2) consultation by the parties, and potentially contract revisions to maintain the “balance of benefits,” if PIRP is eliminated or significantly altered.

PPA revisions to address PIRP elimination would be costly and time-consuming. For example, CPUC approval of contract revisions is a 9-12 month process, and there is simply not sufficient time between the proposed September 2013 CAISO compliance filing and the Spring implementation for these contract revisions to occur. Grandfathering projects with PPAs in effect, or in advanced stages of negotiation, would thus avoid the need to delay CAISO implementation of these changes.

A reasonable grandfathering provision would be the same as that used in the CAISO’s recent Technical Bulletins (TBs) on generator-interconnection study methodology – e.g., applying to contracts executed by year-end 2012. The same rationale applied in the TBs – to avoid disrupting already-executed contracts, or those under negotiation – would apply here, and the CAISO should include this provision in its next Proposal version.

#### **CAISO Response**

The ISO will consider limited grandfathering provisions with an explicit expiration following full stakeholder discussion.

#### **Proposed scheduling timeline**

Maintenance of the 20-minute e-tag submission deadline, which prevents the CAISO from allowing schedule submission closer than 37.5 minutes before real time.

The CAISO stated at the Meeting that it could allow schedule submission closer to real time (and, within the operating hour, closer to the applicable binding interval) than the proposed 37.5 minutes if not for maintenance of the 20-minute e-tag submission provision. Even under the proposed timeline, some attendees expressed considerable concern that the 2.5 minutes allowed under this timeline between schedule issuance and e-tag submittal would be insufficient, and LSA expects that at least some of them will want more time – pushing the 37.5-minute schedule submission deadline even further.

LSA submits that the only way to resolve this problem – and reduce the still-considerable lead time that continues to exacerbate the above-stated concerns about PIRP elimination – is to reduce the lead time needed for e-tag submittal – preferably, to something like 10-15 minutes. LSA understands that this may require negotiations with adjacent Balancing Authority Areas (BAAs). The CAISO should attempt to negotiate this change with those BAAs, with implementation concurrent with (or soon after) implementation of 15-minute scheduling.

#### **CAISO Response**

The ISO will honor all WECC tagging timelines.

### Options for mitigating impacts

- Lack of additional options to mitigate implementation impacts – i.e., options to:
  - Submit three 5-minute schedules for a 15-minute interval (for this initiative and also FRP, if the latter will utilize 5-minute settlements), to better accommodate known ramping production levels; and
  - Utilize a forecast from the CAISO Forecast Service Provider (FSP), which would allow continuation of existing PIRP scheduling practices (whether or not PIRP is retained) and retain other benefits of the current forecasting structure.

LSA recommends that the CAISO consider two additional design elements to mitigate potential adverse impacts on market participants.

First, the CAISO should continue to offer the current FSP-provided forecast as an option for VER Scheduling Coordinators (SCs). The forecast timing and structure would have to be adjusted as appropriate for the new framework (e.g., posting of a 15-minute schedule by 49.5 minutes before the start of the applicable 15-minute interval (15 minutes before the 37.5-minute schedule submission deadline), or a rolling 5-minute forecast).

Today, VER SCs typically automate extraction of the FSP forecasts and submission of the forecast as the VER schedule. This option would allow those arrangements to remain in place. Moreover, the FSP forecast features important economies of scale and accuracy elements, since the FSP has unique access to data from all of the VERs in every area of the CAISO system. These features likely facilitate more accurate forecasts than an individual developer, or a third-party forecaster with more limited data access, could produce.

Second, the CAISO should allow optional submission of three 5-minute forecasts for each 15-minute scheduling interval, instead of the current plan to accept 15-minute forecasts and divide them into three equal amounts, for purposes of calculating real-time imbalances (and, if 5-minute settlements will be used for FRP, for that purpose as well). Many VERs have fairly predictable ramps throughout certain operating hours, and use of 5-minute schedule submissions will both provide the CAISO with more accurate schedules and reduce imbalance (and FRP) charges to VERs.

### CAISO Response

The ISO will continue to allow VERs to utilize the ISO forecast provider. In fact, several other stakeholders have expressed concerns with allowing non-ISO forecast to be used to set financially binding schedules in real-time.

The use of the ISO forecast would ensure that the forecast used is as close as possible to the start of the binding 15 minute market optimization. If a SC selected to use the ISO forecast, we would continue to allow those arrangements to remain in place.

The ISO will allow the use of 5 minute granular forecasts, but the RTPD optimization uses 15 minute market intervals and not 5 minute, thus the need to take the simple average of the three 5 minute

forecasts. If 5-minute forecasts are provided, RTD will use that in applicable 5-minute intervals.

Company	Date	Submitted By
Morgan Stanley Capital Group, Inc	November 16, 2012	Steve Huhman at (914) 225-1592 <a href="mailto:Steven.Huhman@morganstanley.com">Steven.Huhman@morganstanley.com</a> .
<b>Additional bids for Transmission above offered energy levels</b>		
<p>Energy bids in HASP carry with them an implicit bid for transmission to deliver on the energy. However, it is possible to bid for additional transmission over and above your energy bid. What form will this additional transmissions bid take (i.e. is it \$/MWh, does it cover only the congestion component of the 15 minute LMP, can you get the extra transmission for some 15 minute intervals but potentially not all 4 - 15 minute intervals in a given hour, etc.)? Also, if you do procure extra transmission above your energy schedule in HASP but then don't use it, and there is congestion in the 15 minute market, are you paid the congestion charge since you released transmission space into a congested market? Can you procure this extra transmission space in DA or just HASP? Some more detailed guidance around how this will work will be helpful.</p>		
<b>CAISO Response</b>		
<p>We will provide additional explanation in technical workshop. As correctly pointed out, the transmission bid is implicit within the energy bid curve. The ISO will clarify that explicit transmission bids are only required for VERs with self-schedules. The TR is unidirectional, thus there are two TRs – one in the import direction and one in the export direction based upon the scheduling limit in the relevant direction. Only imports can receive import TRs and only exports can receive export TRs. There is no settlement for released TRs in a subsequent market. Only incremental TRs in a subsequent market are settled.</p>		
<b>Meshing hourly bids with CAISO 15-minute dispatch</b>		
<p>It is clear that if you do not want your schedules to change every 15 minutes in RT then you should self-schedule. If you do put an economic bid on your resource, and it is not dispatched in HASP, the economic bid survives into the 15 minute market and you may still get dispatched up or down based on that bid. During the discussion at the Stakeholder conference, there was some dialogue about being able to put a flag on your economic bid such that if you are not dispatched in the HASP market, then you state you do not want to participate further in the 15 minute market. MSCG strongly supports this suggestion. Indeed, we would like to see availability of a flag to say that you want a 'block' dispatch in HASP (i.e. the same for each 15 minute interval).</p> <p>Our expectation is that if the CAISO does not allow for this, then there will be vastly more self-schedules than there are now (people will do this to be assured of a block dispatch). Even if the WECC transmission market moves to 15 minute scheduling, many suppliers (i.e. utilities) may still not accommodate marketers changing hourly schedules every 15 minutes. A change for the whole hour could be accomplished with such a flag. Any resource that can truly respond to 15 minute changes is still free to let its economic bid survive into the 15 minute market.</p>		
<b>CAISO Response</b>		
<p>The ISO will allow the following options:</p>		

Hourly block self scheduled in HASP. TR = HASP advisory energy schedule

Hourly block economically bid in HASP, then advisory energy schedule is automatically self-scheduled for the 15 minute market. TR = HASP advisory energy schedule.

Economically bid in HASP, economically bid in 15 minute market only, then considered SS in RTD incorporating schedule ramps. TR = average of 15 minute HASP advisory energy schedule.

Dynamic transfers, bid in HASP and in 15 minute market. Hour ahead TR determined by HASP separately in each 15-min interval. 15-min TR deviation determined by RTPD in each 15-min interval.

### **Coordination with WECC**

CAISO stated that it is coordinating development of 15-minute protocols with WECC. MSCG strongly supports the CAISO doing so. That said, we suggest that such coordination not unduly inhibit the development and implementation of a strong vigorous structure as fast as possible. There is a risk that Balancing Authorities will have widely divergent views on how to meet FERC's requirements, which could bog down the WECC process. If this occurs, the failure of the WECC process to move forward as quickly as the CAISO shouldn't result in a delay in deployment. If the functionality is installed and approved by FERC, we anticipate that this could actually accelerate the WECC process. Coordinate, of course, but don't design your systems to the lowest common denominator.

### **CAISO Response**

The ISO recognizes that 15 minute schedules are optional. This is why we are utilizing the transmission reservation process and still allowing hourly block schedules.

### **Inability to respond to 15-minute dispatch**

MSCG strongly supports creating a capability in the software to put in an operational constraint "flag" on a unit, indicating an inability to respond in the 15 minute market. In particular, we believe this is a "must have" for VERs; a lack of wind/sun should be considered a valid operational constraint for not responding.

### **CAISO Response**

VERs due to operational characteristics can update their 15 minute self-schedule at 37.5 minutes prior to binding 15 minute interval and as frequent as every 5 mins on a rolling multi-interval time horizon.

### **Penalty Pricing**

During the stakeholder meeting, some market participants strongly advocated instituting a "worst-of" pricing rule for any bidder that does not deliver on its 15 minute schedule. MSCG believes such a step is not justified in the initial design. We recommend observing how the new features "play out", rather than going directly to a "penalty pricing" regimen. We do not see any reason why there will be a persistent, predictable bias between the 15 minute market and the 5 minute RT market that could be exploited. Also, the flex ramp charges will flow back to uninstructed schedules via an uplift, providing an "extra" disincentive. Finally, internal resources aren't subject to worst-of pricing, so intertie likewise should not be subject to this without a well-documented need for it. Therefore, while we do not object to holding a "penalty pricing" option in reserve, it should not be deployed until an ongoing, systemic problem that must be resolved is documented.

### **CAISO Response**

The ISO is considering the “worse of” settlement rule, but in the context of a broader treatment of all uninstructed deviations under the new 15 minute market design.

**Internal and Import Parity**

MSCG advocates parity of treatment for internal and external resources. This proposal removes many practical, historical reasons for not having done so previously. As part of this process, we would like to see the CAISO formally and officially adopt this principle. It is particularly important with regard to situations in which Bid Cost Recovery is in play. In particular, lack of Bid Cost Recovery for hourly block importers that is available to internal resources is inequitable, is likely to reduce liquidity, and thereby potentially impairs reliability. This is because, at least as so far described, hourly block bidders appear to be wearing the risk of price changes between the hourly and 15 minute prices.

**CAISO Response**

Internal resources do not receive bid cost recovery based upon their hourly day-ahead schedule in real-time. BCR for hourly schedules is only available in day-ahead.

In real-time, both internal resources and intertie transactions responding to the 15 minute market and RTD are eligible for BCR. No hourly block schedules are eligible for real-time BCR.

Company	Date	Submitted By
NRG Energy, Inc. (“NRG”)	November 16, 2012	Brian Theaker

**Block-hour intertie schedules**

In general, NRG supports the CAISO proposal that, in order to obtain a block-hour schedule, an intertie supplier has to self-schedule the desired amount across four 15-minute intervals, and, as a result, would be a price-taker for that amount in the four 15-minute intervals. This proposal helps level the playing field for intertie and internal resources by eliminating the preferential block-hour and perpetually problematic HASP settlement for intertie suppliers.

The one drawback to this proposal is that increasing the number of self-schedules may adversely impact the CAISO’s ability to adjust intertie resources to address congestion. Having the ability to adjust all intertie schedules on a 15-minute basis would provide the CAISO with the greatest flexibility. However, NRG does not have a feel for how requiring intertie suppliers that want block-hour schedules to provide self-schedules compares to the current intra-hour dispatch flexibility (or lack thereof) that comes from block-hour intertie schedules. NRG would appreciate if the CAISO could indicate (1) how much intrahour dispatch flexibility is currently available from block-hour interties, and (2) how the CAISO expects its proposal to require self-schedules for those parties that want to maintain block-hour schedules will affect that flexibility.

**CAISO Response**

The ISO does not have an estimate of 15 minute schedule flexibility existing since intra-hour scheduling has only be done on a pilot basis. The requirement for self-schedules for parties that want to maintain block hour schedules does not impact the flexibility and is no different than how HASP schedules are currently treated in RTD and the non-financially binding RTUC. As more and more balancing authority

control areas are switching to support 15-minute schedule, ISO does expect less and less hourly block schedule being submitted.

**Hourly inertia transmission reservations and 15-minute energy awards**

NRG is intrigued by the CAISO's proposal to provide both full-hour transmission certainty and 15-minute energy flexibility for inertia resources. This critical aspect of the CAISO's proposal, which market participants are working to fully understand, warrants much more discussion. That discussion would benefit from detailed examples and scenarios developed by the CAISO and shared with market participants.

**CAISO Response**

The ISO has posted settlement examples.

**Eliminating PIRP**

The CAISO proposes to allow Variable Energy Resources (VERs) the opportunity to submit forecasts of 15-minute output 37.5 minutes prior to the relevant 15-minute interval. More specifically, the CAISO proposes to require VERS to submit a minimum two-hour rolling forecast with 15-minute granularity, with the 15-minute interval forecast for the binding interval submitted 37.5 minutes prior to the binding interval. The CAISO also intends to offer VERS the opportunity to submit a rolling two-hour forecast with five-minute granularity, and will use the average of the three five-minute forecasts to determine the 15-minute forecast against which the 15-minute imbalance for the binding 15-minute interval will be determined. The CAISO offers that because these closer-to-real-time forecasts should be more accurate than the current hourly PIRP forecasts, which are developed 90 minutes prior to the hour, the need to net imbalance energy across a month is reduced, and the PIRP program can be eliminated.

NRG requests that the CAISO provide data indicating how much 15-minute forecasts submitted 37.5 minutes prior to the relevant interval will reduce imbalances relative to hourly forecasts submitted 90 minutes prior to the hour. The validity of this critical assumption – on which the future of the PIRP program hinges - should be rigorously demonstrated through actual data before it is allowed to be put into effect. Such analytics are appropriate given that the CAISO is proposing to change two key variables – the length of the forecast/balancing interval and the amount of time before the interval that the forecast is submitted.

**CAISO Response**

The improved forecasting closer to flow is the fundamental premise of Order 764. The ISO will consider this request for analysis.

**Five-minute settlements**

NRG is still evaluating the impact that moving from ten-minute settlements to five-minute settlements would have on its market systems.

**CAISO Response**

Thanks

**Flexible Ramping Down**

On page 16 of the CAISO's proposal, the CAISO observes: "On an hourly basis, variable energy resources that wish to participate in the flexible ramping down product will provide the energy bid that will be

used to reduce the 5-minute energy schedule from the 15-minute self-schedule, the resources ramp rate, and FRD bid price.” (emphasis added) Given that the CAISO is proposing to eliminate the real-time bid to provide Flexible Ramping Up, it is not clear why the CAISO appears to be proposing to retain the FRD bid. To be clear, NRG does not support eliminating the FRU bid in real-time, but perceives a conflict between FRU and FRD and requests the CAISO clarify its position.

**CAISO Response**

This is an error. The current FRP proposal does not allow real-time FRP bids from any market participant in the real-time market. This includes VERs.

**Initial Questions #1**

Does the CAISO intend to liquidate hourly DA virtual bids against a simple average of the relevant 15-minute prices?

**CAISO Response**

It is mathematically irrelevant where the price is the weighted average or simple average. Since the virtual quantity liquidated in all 15 minute interval is the same, the simple average and weighted average are equal.

**Initial Questions #2**

Will the CAISO issue dispatch instructions to internal generators that reflect their 15-minute market awards separate from the dispatch instructions that reflect their five-minute market awards?

**CAISO Response**

All dispatch instructions will come from RTD. Same as today. There will not be dispatch instructions issued for the 15-min Energy schedule. However, the ISO currently plans to use CMRI to convey scheduled for the 15-minute market for both energy and ancillary services.

**Initial Questions #3**

The CAISO has indicated it will settle differences in DA load schedules at the weighted average LMP of the 15-minute and five-minute RTD prices (Straw Proposal at 14). When RTD forecast demand equals hourly metered demand, the proposed settlement is revenue neutral. If RTD forecast demand does not equal metered demand, there will be an offset. How does the CAISO propose to allocate that offset?

**CAISO Response**

The ISO has posted an example. The offset will be allocated to metered demand.

Company	Date	Submitted By
Olivine		
<p>The proposal does a good job of balancing the tension between overdue reform of the CAISO market timelines within the context of interchange scheduling in the WECC interconnection while meeting the directives of FERC Order 764. Alignment of the 15 minute RTUC and RTD is an essential element of market refinements designed to address price inequities and volatility unrelated to supply and demand</p>		

conditions. From its inception, the CAISO has been at the leading edge of advancing WECC scheduling practices and the proposal provides enough flexibility to continue to adapt to any future WECC scheduling practices without completely disregarding existing practices.

Moving from 10-minute settlement to 5-minute settlement eliminates the need to calculate 10-minute prices from 5-minute market outputs and in and of itself is a simplification to the myriad settlement calculations. Since it will require changes to market participant business processes and software, it needs to be fully vetted with market participants to determine the scope of the changes and to determine the time required to make those necessary changes.

To the extent that the option to schedule at 15-minute granularity improves the scheduling accuracy of Variable Energy Resources, the opportunity to eliminate PIRP is timely. PIRP was an early concession to encourage the integration of wind and solar resources and has served its purpose. The more comprehensive changes in this initiative and the broader renewable integration efforts more appropriately and universally address the inclusion of VERs into the wholesale market.

In the absence of more granular and frequent demand scheduling, the approach of weighted average 15 and 5 -minute procurement for settling imbalance energy is fair so long as the forecasting accuracy and procurement balance the volume of energy procured in the 15-minute market versus the 5-minute market are as consistent as the supplied data suggests.

**CAISO Response**

No comment

Company	Date	Submitted By
Pacific Gas & Electric Company	November 16, 2012	Jonathan Taylor - (415)-973-3731 Partha Malvadkar - (415)-972-5842
<b>Market Communication Software</b>		
<p>PG&amp;E would like further details about the market systems the CAISO is planning to develop to use in conjunction with 15-minute scheduling. Today, financially binding instructions are sent through the Automated Dispatch System (ADS) to market participants. These financially binding instructions are a product of the CAISO's RTD (5-minute market). The only medium that the CAISO has at its disposal for information transmittal in the 15-minute market is CMRI. Currently, CMRI is used to transmit Ancillary Service Awards and Flexible Ramping Product (Proposed), both of which are by products of the 15-minute market. Therefore, further clarity around how the existing tools can be used to transmit results of its 15-minute market to market participants is needed.</p>		
<b>CAISO Response</b>		
<p>The ISO currently plans to use CMRI for the 15-minute market for both energy and ancillary services. The day-ahead awards and 15-minute award are similar in that they are both forward financially binding schedules. Financially binding instructions are from RTD via ADS. Real-time commitment instructions will continue to be sent via ADS.</p>		
<p>Separate from this initiative, ISO is also considering an architecture project to merge CMRI and ADS into</p>		

a single application. Upon that, market participants will be able to get all schedules, capacities and instructions from a single interface.

### **E-Tagging Requirements**

PG&E does not believe that 2.5 minutes is sufficient time for market participants to be required to submit e-tags for energy flowing across an intertie, especially if they'll now be done four times an hour. Currently participants have approximately 40 minutes to submit tags that cover the full hour.

- Intertie awards are made 45 minutes before the binding interval.
- E-tags are due 20 minutes before the binding interval.

Under the CAISO's proposed timeline, market participants would only have 2.5 minutes to submit tags and would have to do so four times an hour.

- Awards would be received at 22.5 minutes before the binding interval
- E-tags are still required to be submitted 20 minutes before the binding interval

This timeline does not seem feasible given the many requirements of submitting a tag and the necessity for check out on the tags without automated mechanisms being developed. PG&E believes further clarity and work with associated balancing authorities to produce an implementable timeline is likely needed to understand how this proposal can be implemented.

### **CAISO Response**

Only the energy schedule for 15-minute awards is updated within the 2.5 minute timeline.

The ISO has balanced the need for market participant updates with the start/finish of the market optimization for the binding interval and the 20-minute tagging requirement.

### **Removal of Hourly Bids from the 15-minute Market**

At the stakeholder meeting, there was significant discussion about removing bids submitted at t-75 from the subsequent 15-minute market processes.

The reason stakeholders were concerned about this issue was because bids submitted for the hourly process are carried through to the 15-minute market. If a resource were to submit a bid at t-75 and not be economical, it would not receive an energy or transmission award. However, the same bid would be carried through to the 15-minute market optimization process. The CAISO stated at the stakeholder meeting that it would be possible for market participants that were initially uneconomical to receive an award in a later 15-minute market interval.

The concern is that the CAISO will make awards in the 15-minute market that are not feasible due to plant limitations and that participants will not have the transmission capacity to deliver energy. Therefore, PG&E seeks further information about how the CAISO proposes to address situations where a market participant receives a 15-minute award that cannot be met due to lack of transmission, infeasible plant operation and lack of time to submit an E-Tag.

### **CAISO Response**

The ISO will allow the following options:

Hourly block self scheduled in HASP. TR = HASP advisory energy schedule

Hourly block economically bid in HASP, then advisory energy schedule is automatically self-scheduled for the 15 minute market. TR = HASP advisory energy schedule.

Economically bid in HASP, economically bid in 15 minute market only, then considered SS in RTD incorporating schedule ramps. TR = average of 15 minute HASP advisory energy schedule.

Dynamic transfers, bid in HASP and in 15 minute market. Hour ahead TR determined by HASP separately in each 15-min interval. 15-min TR deviation determined by RTPD in each 15-min interval.

### Transmission Scheduling

15-minute energy scheduling may create problems or inefficiencies relative to the hourly transmission scheduling and has the potential to inefficiently allocate transmission capacity at the ties. One potential solution for this would be for the CAISO to co-optimize its market model with other Balancing Authorities to improve the use of intertie energy and transmission. Therefore, PG&E recommends the CAISO work to enable 15-minute transmission scheduling as well.

In addition, PG&E seeks clarification as to why the CAISO is allowing intertie resources to hedge against congestion on an hourly basis using the CAISO's new transmission reservation mechanism?

CAISO Comment:

The ISO is seeking to use functionality from the Dynamic Transfers initiative which has already been through a stakeholder process and approved by the BOG. The transmission reservation allows VERs to be awarded intertie transmission greater than their expected hourly energy.

Company	Date	Submitted By
Powerex	November 16, 2012	Gifford Jung 604-891-6040
Hourly Transmission Capacity		
<p>Powerex requires significantly more details on the proposed hourly transmission capacity framework, as it is not clear to Powerex:</p> <ul style="list-style-type: none"><li>a) What objectives the CAISO is trying to achieve via awarding explicit CAISO transmission rights in real-time;</li><li>b) How these transmission rights facilitate hourly e-tagging of transmission necessary for energy awards in the first interval, as well as incremental energy awards (imports or exports) that may be awarded in subsequent intervals; and</li><li>c) How these transmission rights will align with e-tagging requirements in neighboring jurisdictions.</li></ul> <p>Powerex is concerned that the CAISO's approach may have the unintended consequence of unnecessarily reducing the availability of intertie resources to deliver intra-hour energy, via unnecessarily limiting the ability to e-tag transmission prior to the hour for all intervals.</p> <p>Powerex believes the need for CAISO to implicitly or explicitly award incremental hourly intertie</p>		

transmission rights in real-time, should be for the sole purpose of deciding which e-tags to curtail - in the limited circumstances where the CAISO has total implemented e-tags at its hourly check-out process with greater scheduled transmission rights than available CAISO transmission capacity for any 15-minute interval. Powerex believes the CAISO should consider the following approach:

1. Accept and approve all e-tags that have transmission profiles that do not exceed the resource's respective energy bids, independent of whether or not such resources have energy awards in the first 15-minute interval; and
2. If the CAISO has aggregate e-tagged transmission profiles which exceed the CAISO's available transmission in any 15-minute interval, as determined at the hourly check-out process, the CAISO reduces those e-tags which have transmission profiles that exceed the energy award quantity in the first 15-minute interval, based on the least economic, first-out principle.

This approach will ensure that the CAISO accepts the maximum e-tagged transmission possible, thereby enabling energy dispatches in future intervals, while at the same time not pro-rata curtailing e-tagged energy awards in the first interval to enable potential energy awards in a future interval from a different resource that may or may not be dispatched. It is essential that the CAISO allow resources that may be called upon to deliver energy in a future interval to e-tag their transmission profile prior to the hourly check-out process, as necessary on neighboring transmission systems, provided such transmission profile does not cause the CAISO to exceed CAISO transmission limits.

This approach is also consistent with the CAISO's current approach to e-tagging dynamically scheduled inertia resources. Any requirement to acquire limited CAISO transmission rights prior to submitting e-tags will create substantive seams issues and has the likely undesirable outcome of broadly restricting participants' ability to provide 15-minute energy in future intervals and/or to provide dynamically dispatched energy. Powerex does not fully understand, nor see the need for, the more comprehensive CAISO real-time transmission product as outlined in the Straw Proposal, but looks forward to future discussions on the topic.

#### **CAISO Response**

The ISO has posted settlement examples.

In addition, the ISO is evaluating if the TR can be simplified. In addition, the remaining uplift from having the TR process has been highlighted by some stakeholders as a barrier to convergence bidding on the inerties.

#### **Hourly Energy Schedules**

As previously described, Powerex believes the CAISO should:

- a) Reconsider its transmission framework as discussed above; and
- b) Allow entities to submit either economic bids or self-schedules, with a flag that indicates the resource must be dispatched for the entire hour, may be dispatched in 15-minute intervals, or may be dispatched in 5 minute intervals (i.e. dynamic resources). The CAISO would evaluate those resource bids that are flagged hourly dispatch against the expected average hourly price, and dispatch accordingly. However, Powerex agrees with the CAISO that no make whole payment should be made as this would drive uplift costs, and lead to other unintended

consequences.

### CAISO Response

We will allow a flag.

### Participation in 15-Minute Market and RTD

Powerex has both confusion and concerns with the CAISO's description of bidding and energy dispatch. Powerex believes the CAISO should allow resources to bid as described above, and should accept e-tags for all associated bids, up to CAISO transmission limits, without the need to develop a separate transmission product.

Powerex supports the CAISO in restricting the ability for any resource to change its price or quantity after the hourly bidding timeline, except to the extent that a change in quantity is necessary due to a change in the physical capability of the resource. To this end, Powerex believes the CAISO must re-define and enforce three separate energy product types:

- 1) Firm energy – delivery will only be reduced due to
  - a. Transmission curtailment.
- 2) Unit contingent energy – delivery will only be reduced due to
  - a. Transmission curtailment, or
  - b. A qualifying contingency event that allows the CAISO to deploy its contingency reserve pool.
- 3) Variable resource contingent energy – energy may be reduced or increased due to:
  - a. Transmission curtailment,
  - b. A qualifying contingency event that allows the CAISO to deploy its contingency reserve pool, or
  - c. Forecasted change in output of the resource outside of participants' control or discretion.

It is imperative that the CAISO not design its market to allow for intertie deliveries that may be changed at the participants' discretion after the close of the hourly bidding deadline, without ensuring that the participant bears the full cost to the market of such changes. More specifically, providing a discretionary opportunity to change delivery quantity after the bidding window has closed creates very troublesome opportunities for participants to change their delivery quantities based on their own portfolio's net position and prevailing CAISO real-time prices, which can have both substantive market efficiency and reliability consequences. Therefore, Powerex strongly recommends that sufficient clarity on energy product types as well as sufficient enforcement measures be instituted, including appropriate incentives for failures to deliver as later discussed.

In addition, Powerex strongly recommends that entities wishing to deliver variable resource contingent energy (i.e., for VERs whereby the source Balancing Authority is not carrying sufficient balancing and/or contingency reserves to meet the Firm or Unit Contingent requirements), should be required to submit updated 15-minute quantities based solely on the CAISO's forecasted change to the resources output.

### CAISO Response

Changes to 15 minute self schedules of hourly block schedules must be due to a generation outage or

transmission derate which is known prior to the start of the binding 15 minute market optimization. The curtailment has to be physical reason not because of participant's discretion.

Regarding the different types of energy, the ISO is considering these comments in evaluating simplification of the TR.

#### **15-Minute Market Process**

Powerex generally supports the description of CAISO's 15-minute market process, but looks forward to further discussions on this topic.

#### **CAISO Response**

No comment

#### **Settlement with 15-Minute Market**

Powerex is in general agreement with CAISO in settling all instructed energy (based on instructed deviations from IFM award) at the applicable 15-minute or 5-minute price. Powerex understands that the 15-minute price will be a weighted average of the 5-minute price and that both the 15-minute and 5-minute prices will therefore be determined in the same LMP optimization processes, negating uplift concerns between these two settlement prices. Powerex requests that the CAISO clarify if this understanding is incorrect. Powerex also requires more details, with examples, on how specific transactions will be settled.

With respect to uninstructed deviations, Powerex believes the CAISO needs to settle real-time quantity changes that occur for acceptable reasons, as set forth in the energy products described above, at the applicable 15-minute or 5-minute price, without any additional penalty. Powerex believes it is imperative that uninstructed deviations that occur for reasons outside those defined under the applicable energy product type receive pricing that effectively discourages such behavior. Perhaps the worse-of the 5-minute, 15-minute or IFM price should be applied to any such deviations, ensuring that such failures are not profitable. Powerex believes that poorly defined or enforced energy product types, and/or insufficient incentives to encourage delivery on physical awards, will continue to cause unintended consequences in CAISO markets including increased uplift charges to metered demand due to physical re-dispatch in real-time, and systemic price divergence, with the potential for reliability consequences.

#### **CAISO Response**

Both the 15 minute market and 5 minute market are settled based upon the appropriate market optimization – that is the 15 minute market is settled based upon the 15 minute market optimization and not the weighted average of the three 5 minute optimizations.

#### **Variable Energy Resources**

Powerex believes that clearly defining and enforcing energy product types; limiting the ability of VERs to change schedules to any level other than the CAISO's forecast of VER output; and applying appropriate settlement treatment at the applicable LMP, as described above, will provide an efficient framework for VER imports to schedule in the IFM and real-time markets. This framework will allow VERs the option of either acquiring sufficient balancing and/or contingency reserves from the source balancing authority

(and thus treated as a firm energy resource), or acquiring sufficient balancing and/or contingency reserves from the CAISO (and appropriately treated as variable resource contingent energy resource).

While all energy product types should receive similar treatment from an energy perspective (i.e. receiving the quantity delivered times the applicable LMP price), different energy product type alternatives should be treated distinctly from a capacity perspective. More specifically, VERs that are sufficiently balanced by the source balancing authority and scheduled as firm energy resources should not be allocated additional CAISO contingency reserve costs or flexi-ramp costs whereas as VERs scheduled as variable resource contingent energy resources should be allocated additional contingency reserve costs and flexi-ramps costs consistent with cost causation. Further, firm energy imports scheduled in the IFM, including VER energy, should not be exposed to RUC costs, whereas as VERs scheduled in the IFM as variable resource contingent energy should be exposed to appropriate RUC costs, again consistent with cost causation.

Powerex believes further discussion is necessary on whether VER imports should be able to change schedule quantities in 15-minute increments versus 5-minute increments, as well as how to address changes in VER imports when there is insufficient available transmission capacity to accommodate such changes without displacing other resources.

#### **CAISO Response**

VERs can only change their 15 minute self-schedule up to their transmission reservation. If insufficient transmission capacity is available, any self-schedule above the transmission reservation will be curtailed.

#### **Flexible Ramping Product**

Powerex requires further details and discussion on the flexible ramping product and will make comments in the separate FRP stakeholder process.

#### **CAISO Response**

No comment

#### **Convergence Bidding**

Powerex supports the CAISO's approach to settle all convergence bids, both internal and interties, at the applicable IFM and 15-minute market LMP.

Powerex believes the 2-settlement framework should enable the CAISO to efficiently re-implement intertie convergence bidding, but with some caveats.

First, Powerex believes the CAISO must recognize that substantive changes to its RUC process, including increased cost allocation to virtual bidders consistent with cost causation, will be necessary. Specifically, Powerex believes the CAISO must extend its IFM RUC process to include both the current "INC" RUC product as well as a new "DEC" RUC product. Powerex also believes the CAISO must extend its RUC product to include qualifying resources on the interties. This expansion of the CAISO's RUC products will enable CAISO operators to have sufficient real-time INC and DEC bids as conditions warrant, thereby prevent the need to "skew" real-time intertie dispatches to create desired INC or DEC flexibility for reliability purposes intra-hour. Such operator skewing of intertie dispatched in an LMP market, particularly one with convergence bidding, inevitably causes substantive market inefficiencies. In today's

design, this LMP outcome “skewing” manifests itself in large uplift charges to load as a result of physical intertie dispatches in one direction and subsequent physical internal dispatches in the other direction, as well as systemic convergence bidding profits, with both activities funded by uplift charges to metered demand. Under the proposed 2-settlement framework, such operator “skewing” is likely to manifest itself differently, but with similar troubling consequences to market efficiency. Specifically, operator skewing will lead to intertie resources that must be scheduled hourly, settling at prices that are systemically inconsistent with their bid price, resulting in reduced liquidity on the interties and/or other unintended consequences, as participants respond to the distorted price signals.

Second, Powerex believes that the CAISO must quickly remove any convergence bidding position limits on the intertie to enable the market to efficiently respond to anomalous pricing outcomes that may occur on any particular intertie.

Third, Powerex believes that the CAISO must address the dual pricing constraint in a manner that is symmetric in pricing, and treats virtual and physical bids as fully fungible. Powerex strongly opposes Option A for these reasons as set forth in more detail in the previous stakeholder process. Powerex is open to the concept of a Day Ahead E-tag Approval limit (provided such e-tags that are allowed to e-tag are required to e-tag) but believes the modified approach set forth by Powerex in the previous stakeholder process should be further evaluated and discussed.

Fourth, Powerex urges the CAISO to remove the option for participants to delay e-tagging physical IFM awards until real-time as this tacitly encourages implicit virtual bidding activities. By encouraging such activities, Powerex believes the CAISO is inadvertently sidestepping its own RUC process. It is widely accepted in LMP markets that future real-time supply can “lock-in” the IFM price, as well as compete in the IFM markets, via the combination of a virtual supply award and a real-time physical award. Such an approach settles at the IFM price less appropriate RUC charges - which is effectively the reliability cost of backstopping prospective real-time supply that may not show up. It is both inefficient and potentially dangerous from a reliability perspective, to continue to allow such prospective real-time supply to compete directly in the IFM market as physical supply, thereby sidestepping the CAISO’s RUC process and applicable charges.

Fifth, Powerex strongly urges the CAISO to take a fresh look at the CRR clawback rule. Powerex believes the current CRR clawback rule can be materially improved, reducing both false negatives which distort energy prices for all market participants, as well as false positives which unnecessarily limit physical liquidity on the interties.

In summary, Powerex believes the CAISO is on the right track with its efforts towards a 2-settlement market design and looks forward to further discussions on the many important details.

#### **CAISO Response**

The ISO is evaluating using RUC schedules for purposes of day-ahead tagging to resolve the dual constraint issue. In a Flexible Ramping Product initiative, the ISO is also considering merging both IFM and RUC with the new iDAM market. In this proposal, RUC schedule is determined in the same optimization process as the IFM schedule and it can be higher or lower than the IFM schedule.

Company	Date	Submitted By
Renewable Northwest Project	November 16, 2012	Cameron Yourkowski
<b>Scheduling Window</b>		
<p>We are currently unclear as to how far in advance the proposal would require VERs to submit their 15-minute energy schedules. The Straw Proposal states that “tagging energy schedules for the 15-minute markets requires that the ISO begin the market optimization 37.5 minutes prior to the binding interval so that awards can be made at 22.5 minutes prior.” Does this mean that VERs can use a 37.5-minute or a 22.5-minute “persistence-based forecast” to set their schedule? The key to maximizing savings on BPA’s VERBS charge is how close to real-time flow the VER generator can develop a persistence forecast and associated schedule based on what the resource is actually generating at that time. The closer to real-time flow the schedule is developed and submitted, the more accurate the schedule will be. This improved scheduling accuracy decreases the amount of balancing reserves BPA must hold to balance wind and other VERs and in turn, allows BPA to decrease the rate.</p>		
<b>CAISO Response</b>		
<p>VERs can use a 37.5 minute prior forecast to update their self-schedule of expected energy. This allows the change to be considered in the market optimization for the binding 15 minute interval.</p>		
<b>Commitment to a Scheduling Paradigm</b>		
<p>BPA’s incentive rates for 30-minute scheduling, and presumably any 15-minute scheduling rate, are based on the requirement that the VER generator make a commitment to schedule at a stated level of accuracy (e.g., 30 or 22.5 minutes) for every scheduling period of the year. This commitment is important for BPA to be able to make the decision to hold less balancing reserves. CAISO’s approach should strive to allow customers scheduling VERs from the Northwest to be able to fulfill this commitment requirement.<sup>1</sup></p>		
<p><sup>1</sup> As an example, the commitment requirements for BPA’s 30-minute scheduling option can be found here:  <a href="http://transmission.bpa.gov/ts_business_practices/Content/PDF_files/Individual_BPs/Committed_Intra_Hour_Sch.pdf">http://transmission.bpa.gov/ts_business_practices/Content/PDF_files/Individual_BPs/Committed_Intra_Hour_Sch.pdf</a></p>		
<b>CAISO Response</b>		
<p>The ISO believes the exposure to RTD prices for deviations from the 15 minute financially binding schedule provides incentives to improve forecasting by VERs.</p>		
<b>Transmission Reservation</b>		
<p>Our current understanding of the CAISO proposal is that it would still require customers to reserve transmission rights 75 minutes prior to flow and that the energy schedule would be allowed to fluctuate on a 15-minute basis up to whatever maximum transmission reservation was made, but not in excess of the transmission reservation. We are concerned that this aspect of CAISO’s proposal would lead to the over-reservation of scarce intertie capacity. We are aware that when a nondynamic intertie transaction does not fully utilize its hourly transmission reservation in the 15-minute market, the capacity would be made available for other intertie transactions.</p> <p>However, it is our understanding that the released transmission capacity would only be available to other resources in the financially binding interval and would not be guaranteed to other resources for future advisory intervals. It is unclear to us whether this fully addresses the issue of underutilized</p>		

inertie capacity or not. We highlight this issue because of the importance of efficiently moving cost-effective power over the inertie.

**CAISO Response**

Your understanding is correct.

Company	Date	Submitted By
Southern California Edison	November 16, 2012	Jeff Nelson (626) 302-4834 Sarah Van Cleve (626) 302-3255

**CAISO should ensure that its proposed market will harmonize with practices throughout the WECC.**

In its creation of a new market, CAISO must be mindful of existing and proposed future practices of other WECC balancing authorities. CAISO should ensure that its new market will be easily accessible to parties that would like to take advantage of more frequent scheduling. E-tagging practices in particular should be discussed further to ensure that the proposed changes can be accommodated by all entities participating in the CAISO market.

**CAISO Response**

The ISO will honor all WECC tagging timelines.

**CAISO should establish that its proposal fulfills the requirements of Order 764.**

Order 764 calls for the provision of 15-minute scheduling, but the Straw Proposal allows only variable energy resources (“VERs”) to change their schedules every 15 minutes. While CAISO may instruct 15-minute scheduling changes, non-VER resources do not have the option to change their bids or schedules for different intervals within an hour given that CAISO uses the same bids for the entire hour. CAISO should substantiate how its Straw Proposal complies with Order 764, as the Order states that “all transmission customers” shall have the option to change their schedules every 15 minutes.<sup>1</sup>

Establishing the Straw Proposal’s compliance with Order 764 may require additional detail on the mechanics of the proposal. For example, CAISO should explain the consequences of an inertie transactor submitting an electronic schedule tag (“e-tag”) with a quantity that differs from the CAISO award. Since the awarded energy quantity is known prior to submitting the e-tag, will the CAISO simply reject any e-tag for other than the awarded quantity? Alternatively, if CAISO intends to accept such e-tags, then import/export schedules can effectively be changed on a 15-minute basis by simply submitting an e-tag for a different quantity than the CAISO award. If the CAISO accepts such non-conforming e-tags, will the difference between the award and the schedule settle at the 5-minute price? Is the process the same for schedule increases or decreases? CAISO’s proposed approach to these scenarios will have a significant impact on market dynamics and potentially the Straw Proposal’s compliance with Order 764.

<sup>1</sup>“Final Rule,” FERC Order No. 764, 22 June 2012, page 4.

**CAISO Response**

The CAISO will allow block schedules to update their 15 minute self schedules due to physical changes that are known prior to the start of the binding 15 minute market optimization. ISO’s settlement example shall provide more details into the consequences of different scenarios.

**CAISO should explain how it will collectively optimize internal generation and the interties given the new Transmission Capacity Reservation process.**

The interplay between energy bids and transmission bids may result in odd market dynamics. For example, absent transmission capacity bids, if there is an internal generator bid at \$29 and an import energy bid at \$28, the CAISO optimization will award the import energy at the lower price of \$28. However, if an importer also offers a Transmission Capacity bid of \$2, how will the optimization treat the option of selecting between the \$28 energy bid and the \$2 Transmission Capacity Reservation bid? As we understand, the optimization would likely see Transmission Capacity Reservation as \$2 of cost reduction, and as a result cost would be minimized by selecting the \$29 internal energy bid in conjunction with the \$2 Transmission Capacity Reservation (net cost of \$29-\$2 = \$27) as opposed to selecting the \$28 import bid. CAISO should provide greater detail as to how its optimization will consider Transmission Capacity Reservations.

**CAISO Response**

The ISO will propose to limit the transmission capacity reservation to be only available to VERs with self-schedules of their expected energy on a 15 minute basis.

**CAISO should explain which constraints factor into congestion pricing given the new Transmission Capacity Reservation Process.**

CAISO should detail which constraints factor into congestion pricing, with particular focus on the formation of the Transmission Capacity Reservation price. Are both the line constraint and the internal congestion multiplied by the relevant shift factors used in formulating the congestion price? Are there other constraints that factor into the congestion price as well? Will a Transmission Capacity Reservation bid contribute to the ultimate congestion price for all physical transactions?

**CAISO Response**

This formulation is described in detail in the Dynamic Transfers BRS for Variable Energy Resources (VERs) without ancillary services bids; it allows export energy schedules to create import transmission capacity that can be awarded if it is scheduled. Under this option, the import transmission capacity award is a use-it-or-lose-it transmission right in the import direction and a scheduling obligation in the export direction. For simplicity, ancillary services and internal generating resources are ignored and a single inter-tie is modeled.

The following notation is used:

$i$	Index for import inter-tie resources.
$e$	Index for export inter-tie resources.
$EN_i$	Energy schedule of resource $i$ .
$TC_i$	Transmission capacity schedule of resource $i$ .
$ENP_i$	Energy bid price of resource $i$ .
$TCP_i$	Transmission capacity bid price of resource $i$ .
$C$	Objective function.
$D$	Demand.
$F_l$	Import active power flow scheduling limit.

$F_E$  Export active power flow scheduling limit.

Simplified Mathematical Formulation

Assuming a single energy bid segment and ignoring losses for simplicity, the mathematical formulation is as follows:

$$\begin{aligned} \min \quad C &\equiv \sum_i EN_i ENP_i - \sum_e EN_e ENP_e - \sum_i (TC_i - EN_i) TCP_i - \sum_e (TC_e - EN_e) TCP_e \\ \text{s.t.} \quad &\sum_i EN_i - \sum_e EN_e = D \\ &\sum_i TC_i - \sum_e EN_e \leq F_I \\ &\sum_i (TC_i - EN_i) \leq F_I \\ &\sum_e TC_e - \sum_i EN_i \leq F_E \\ &\sum_e (TC_e - EN_e) \leq F_E \\ &EN_i \leq TC_i \quad \forall i \\ &EN_e \leq TC_e \quad \forall e \end{aligned}$$

**CAISO should explain the benefits of procuring Flexi-Ramp Product in the 5-minute market.**

The Flexi-Ramp Product (“FRP”) is a commitment tool which should be used during the 15-minute Real-Time Unit Commitment (“RTUC”) run. The commitment results established in the RTUC run should then be sufficient to meet any flexible ramping needs during that 15-minute interval. The 5-minute real-time market is not a commitment process, and thus procuring additional FRP in that time frame would add unnecessary complexity. Moreover, the RTD process already “looks ahead” many intervals, and thus should be able to ration flexibility without additional constraints. If the CAISO intends to procure FRP in the 5-minute market, it should provide theoretical and empirical support for doing so.

**CAISO Response**

The ISO currently plans to enforce and settle FRP in RTD. The ISO will discuss this approach when we restart the FRP market design initiative in 2H’13.

**Revenue Neutrality and Deviations**

SCE requests the CAISO elaborate on its approach regarding charging incremental procurement to deviations. For instance, consider the case where the CAISO procures power in HASP since based on its forecast it anticipates deviations from DA schedules. Then, if in RT, there are no deviations, what is the procedure for cost allocation of this incrementally procured power?

**CAISO Response**

There will be neutrality charges that are allocated to metered demand. The ISO has posted an illustrative load settlement.

<p><b>Five minute settlements appears reasonable, contingent on analysis.</b></p>
<p>At this time SCE does not object to settlement on a five minute basis, under the assumption that CAISO implementation of five minute settlement will not result in material, adverse impacts on settlement that would be avoidable under 10 minute settlements.</p>
<p><b>CAISO Response</b></p>
<p>No comment</p>
<p><b>CAISO should reduce the incentives for intertie transactors to deviate from dispatch instructions by using a “worse-of” 15-minute or 5-minute price for uninstructed deviations.</b></p>
<p>A prerequisite for integrating VERs is maintaining resource flexibility; in order to maintain flexibility there must be disincentives for uninstructed deviations. Under the current Straw Proposal, implicit virtual bids will be placed using over and under-delivery of physical energy at the interties as entities “chase prices” between the 15-minute and 5-minute markets. Given SCE’s current understanding of the CAISO Straw Proposal, SCE believes implementing a “worse-of” the 15-minute or 5-minute price for the interties that deviate from CAISO instructions would provide sufficient incentive to perform as instructed and would eliminate all incentives for “implicit virtual bids”. Under a “worse-of” framework, the uninstructed energy would settle on the less favorable price of either the 15-minute or 5-minute market, so that entities could never benefit by disobeying CAISO’s instructions.</p>
<p><b>CAISO Response</b></p>
<p>The ISO believes that this discussion should more broadly consider the need to implement an uninstructed deviation penalty for all resources.</p>
<p><b>Given the results of the hour-ahead Transmission Capacity Reservation process, CAISO should allow intertie transactors the option to make certain changes before the start of the hour’s real-time markets.</b></p>
<p>It is likely that many intertie transactors will be unable or unwilling to change their schedules on a 15-minute basis as CAISO’s current Straw Proposal requires. The proposed structure, which does not accommodate hourly schedules, will likely reduce liquidity at the interties or institutionalize uninstructed deviation as transactors cannot respond to 15-minute instructions. To avoid these unintended consequences, CAISO must make provisions to support hourly schedules on the interties for those transactors that are willing to accept the financial risks associated with the fluctuating 15-minute prices. CAISO should allow intertie transactors that are awarded a Transmission Capacity Reservation to change their economic bid to a self-schedule across the hour if they are selected in the Reservation process. While these intertie transactors will assume the inherent risk of being a price-taker, they will have necessary scheduling certainty. Similarly, an intertie transactor that is <b>not</b> awarded a Transmission Capacity Reservation must be allowed to withdraw its bids to preclude subsequent awards in any 15-minute interval within the hour.</p>
<p><b>CAISO Response</b></p>
<p>An economic bid cannot be changed between the transmission reservation process and the 15-minute market. The same economic bid will be used for 15 minute schedules unless the resource has selected block scheduling at T-75. However, the Capacity Limit up to which the economic bid will be considered in the 15-min market (for 15-min resources) and RTD (for dynamic resources) can be revised prior to that market. This feature is especially relevant to VERs.</p>

A resource that is not awarded a transmission capacity reservation, can select at T-75 to have the option to not participate in the 15 minute market. An indication of the block schedule will allow the hourly schedule from HASP to be protected in RTPD. However such indication has to be stated prior to T-75 to avoid market manipulation issues.

**The CAISO should explore the feasibility of 2.5 minutes for updated e-tags<sup>2</sup>.**

SCE has concerns about the impact on operations of the proposed 2.5 minute timeframe for submission of updated e-tags. SCE instead proposes a 5 minute timeframe for tag submission which is more practical to allow operational feasibility. We would hope the CAISO could “make up” for this by shortening the market run-time. The CAISO should solicit stakeholder opinion on a 5 minute timeframe.

<sup>2</sup> Page 11, Section 4.5, <http://www.caiso.com/Documents/StrawProposal-FERC-Order764MarketChanges.pdf>

**CAISO Response**

The ISO has sought to balance changes in our RTPD market optimization, timing of intra-hour etags, and starting/finishing the market optimization as close as possible to flow. The ISO is evaluating current solution times of the 15-minute optimization.

**Neither of CAISO’s proposals to address the dual-constraint problem are sufficient remedies; CAISO should consider SCE’s proposed solutions.**

SCE agrees with CAISO that the dual-constraint problem must be addressed prior to reinstating convergence bidding at the interties. However, neither of the two remedies suggested by CAISO in its Straw Proposal adequately addresses the dual-constraint issue. As SCE demonstrated in its May 7, 2012 comments on the Intertie Pricing and Settlement Second Revised Proposal, the “Option A” solution can be gamed.<sup>3</sup> Furthermore, as SCE discussed in its July 9, 2012 comments on the Intertie Pricing and Settlement Third Revised Proposal, the day-ahead e-tag approval limits solution may threaten reliability, physical liquidity, and market efficiency.<sup>4</sup>

SCE suggests that CAISO implement either of the two dual-constraint solutions that SCE has proposed in the past. First, CAISO could adopt SCE’s proposed Physical Counterflow Feasibility Run, which will not impact physical liquidity and will place uplift risk only on virtual counterflow parties based on causation principles.<sup>5</sup> Second, CAISO could adopt the Virtual Intertie Bids (“VIBs”) solution, which achieves the key goals of virtual bidding hedging, but avoids the major structural problems related to revenue sufficiency and uplift related to virtual bids.<sup>6</sup>

<sup>3</sup> SCE Comments on Intertie Pricing and Settlement Second Revised Straw Proposal, Section C, Pages 2–4, 7 May 2012, <http://www.caiso.com/Documents/SCE-Comments-IntertiePricingSettlementSecondRevisedStrawProposal.pdf>.

<sup>4</sup> SCE Comments on Intertie Pricing and Settlement Third Revised Straw Proposal, Section 4, Pages 5-6, 9 July 2012, <http://www.caiso.com/Documents/SCE-Comments-IntertiePricingSettlementThirdRevisedStrawProposal.pdf>.

<sup>5</sup> “Solving the Dual-Constraint – a Physical Counterflow Feasibility Run”, Southern California Edison, 30 April 2012, <http://www.caiso.com/Documents/SCEpresentation-PhysicalReplacementFeasibilityRun->

[IntertiePricingSettlement.pdf](#).

<sup>6</sup> "Framework to Reinstitute Virtual Bidding at the Interties," Southern California Edison, 17 February 2012, [http://www.caiso.com/Documents/SCEPresentation-IntertiePricing\\_Settlement.pdf](http://www.caiso.com/Documents/SCEPresentation-IntertiePricing_Settlement.pdf).

**CAISO Response**

The ISO is evaluating if RUC schedules should be used to determine MW quantities that can be tagged in day-ahead.

**SCE supports CAISO's proposed transition out of Participating Intermittent Resource Program ("PIRP").**

SCE agrees with CAISO that PIRP is no longer necessary given that Order 764 market changes will provide VERs the opportunity to schedule more accurately. PIRP cannot be justified in a market designed specifically to minimize VERs' uninstructed deviation.

**CAISO Response**

No comment.

Company	Date	Submitted By
San Diego Gas & Electric	November 16, 2012	Randy Nicholson <a href="mailto:RNicholson@SempraUtilities.com">RNicholson@SempraUtilities.com</a>  Victor Kruger <a href="mailto:VKruger@SempraUtilities.com">VKruger@SempraUtilities.com</a>
<b>Hourly transmission awards</b>		
SDG&E's concerns focus mainly on the proposed hourly transmission awards and the allocation of any cost differences between the hourly and 15 minute shadow prices. The allocation of uplift costs due to differences in congestion between the transmission reservation process and real-time should follow cost causation principles as much as possible. The example time lines in the 764 Proposal look workable from SDG&E's perspective. However, SDG&E strongly recommends CAISO present an expanded number of detailed examples in this proposal's next iteration to illustrate how all the new features of the 764 Proposal will work, with particular emphasis on interactions between new and existing market components and their timings. The complications of the hourly transmission awards may be a necessary evil until WECC moves to 15 minute transmission tagging, but the CAISO should have the goal of helping the Western interconnection move as quickly as possible to 15 minute transmission tagging.		
<b>CAISO Response</b>		
The ISO has posted more detailed settlement examples.		

Company	Date	Submitted By
Six Cities	November 19, 2012	Bonnie S. Blair <a href="mailto:bblair@thompsoncoburn.com">bblair@thompsoncoburn.com</a> 202-585-6905
The absence of any opportunity for load serving entities to adjust Demand schedules from		

their Day-Ahead schedules and the related proposal to settle load based on the average of the 15-minute and RTD prices. The Cities' preliminary view is that LSEs should have the opportunity to adjust Demand schedules in the 15-minute market. This would allow LSEs the same opportunity to mitigate costs and manage exposure to allocated charges as the ISO proposes to make available to other market participants.

**CAISO Response**

The 15-minute market is part of the real-time market. In the real-time market, the ISO does not allow economic bids of load. The CAISO forecast of demand must be met to reliably manage the grid.

The proposal to allow financially binding transmission reservations on an hourly basis. Although the Six Cities see potential benefits from this element of the proposal, the Cities are concerned about creating an additional source of uplift costs. At a minimum, the ISO should include a mechanism to limit uplift costs resulting from transmission reservations. In addition, the Cities have not been able as of yet to identify an appropriate method for allocating such uplift costs to the beneficiaries of the reservation process.

**CAISO Response**

The transmission reservation is use it or lose it. In addition, it is unidirectional with imports only settling at the shadow cost of the import transmission congestion and exports settling at the shadow cost of the export transmission congestion. There is also an obligation for imports and exports to schedule if the schedules provided counterflows.

Company	Date	Submitted By
Sacramento Municipal Utility District (SMUD)	November 16, 2012	Gary Lawson <a href="mailto:Gary.Lawson@smud.org">Gary.Lawson@smud.org</a> (916) 732-5802
<b>Price Certainty</b>		
SMUD generally supports the CAISO's 15-minute scheduling and settlement proposal because it provides greater price certainty for physical imports and exports over the interties. Adoption of 15 minute intertie scheduling should significantly reduce forecast deviations and ultimately lessen uplifts associated with the HASP.		
<b>CAISO Response</b>		
No comment.		
<b>E-Tags</b>		
While SMUD agrees in concept to updating e-tags to reflect each binding 15-minute market interval, from a practical standpoint, SMUD is concerned that 2.5 minutes between the Energy Schedule Award and the e-tag deadline might be too short of a time period. This will require frequent monitoring during the hour, and if an e-tag is not updated before the deadline, the intertie transaction is exposed to real-time market uplifts.		
<b>CAISO Response</b>		

The ISO recognizes the concern with 2.5 minutes. Again the ISO is seeking to balance starting/finishing the binding 15 minute market as close as possible to actual flow while honoring the 20 minute tagging requirement and minimizing changes to the ISO market optimization.

**Firm Bids**

SMUD opposes the CAISO’s proposal to treat bids in HASP as firm bids for each 15-minute interval. If a bid in HASP is not awarded for the first 15-minute market interval, the bidder should be provided an opportunity to withdraw its bid for the remaining intervals in that hour. While SMUD recognizes that conditions may change within the hour and a bid could be accepted in subsequent market intervals, obligating bids for the remaining three market intervals will likely discourage participation in the CAISO market from entities outside of the CAISO.

At the October 30th stakeholder meeting, the CAISO indicated it would look into “flagging” HASP bids that are not initially accepted and providing opt-out capability for subsequent market intervals. SMUD strongly supports this approach.

**CAISO Response**

The ISO agrees that at T-75 a resource not awarded a transmission reservation can elect to not participate in the 15 minute market.

**Complete Bid and Dispatch Scenarios**

SMUD believes it would help for the CAISO to run through several complete bid and dispatch scenarios. All stakeholders would benefit from understanding specific examples.

**CAISO Response**

See posted spreadsheet.

Company	Date	Submitted By
Vitol Inc.	November 15, 2012	Kolby Kettler
<b>Intertie (import &amp; export) transactions</b>		
<p>Vitol’s comments below only address the intertie (import &amp; export) transactions related to the CAISO and the WECC region.</p>		
<p>As an alternative to the Straw Proposal, Vitol would request the CAISO consider the following proposal:</p> <ul style="list-style-type: none"> <li>▪ The CAISO would continue with both its DAM and HASP markets with enhancements that allow scheduling coordinators, who can be flexible on a 15 minute basis, the ability to “flag” their schedules for 15 minute intertie re-dispatch. It is a direct approach that provides a solution to the issues that Vitol is raising in this comment letter.</li> </ul>		
<b>CAISO Response</b>		
<p>This does not address the market inefficiencies of the current HASP market design. The ISO believes that not taking this opportunity to address these concerns would not allow the return of convergence bidding to the interties or address market uplifts discussed in previous stakeholder initiatives.</p>		

The CAISO should perform a cost benefit analysis, as well as a market analysis, associated with the implementation of a mandatory 15 minute market to replace the present liquid HASP process.

**CAISO Response**

See previous response.

The CAISO should clearly diagram all impacted transaction types and possible settlement scenarios under all normal and stressed market conditions.

**CAISO Response**

The ISO has posted an example spreadsheet for stakeholders.

The CAISO should clearly define the Hour-ahead process and outline all financial and physical obligations related to a bid at T75.

**CAISO Response**

This is the intent of the technical workshop.

**WECC Taskforce & Discussions - Checkout process**

Checkout process – Currently BAs are checking out prior to the hour , every 30 minutes, and/or when a change in schedule occurs. The Proposal inadvertently suggests all interconnected BAs would checkout energy schedules on a 15 minute basis.

- With the hour-ahead process being a “transmission procurement” process and not a firm energy award, how does the CAISO suggest “checking out” full hourly schedules of interchange if energy is not awarded in the hour-ahead process?
- Does the CAISO suggest that the WECC “checkout” process move to 15 minute increments only, and the removal of an hour-ahead checkout process?

**CAISO Response**

An hourly block schedule can be tagged at the advisory energy schedule. Only resources that want to be economically scheduled in the 15 minute market will update their energy schedules every 15 minutes.

Longer term the ISO believes it would be beneficial to move all checkout to 15-minutes, but will honor hourly block schedules until WECC can make the transition.

**Imbalance energy calculation**

BAs are calculating imbalance energy on an hourly and 30 minute basis. It is clear that not all BAs within WECC will move to a 15 minute imbalance market.

- How will the CAISO address this with its connecting BAs?
- How does the CAISO suggest addressing any rounding issues pertaining to 15 minute scheduling?

**CAISO Response**

Energy sourced from BAs not offering 15 minute scheduling would have to be submitted as an hourly block schedule.

The CAISO will apply a similar rounding process and associated neutrality settlement as today.

#### **USF process**

Currently the USF process is run on an hour-ahead basis and mandates reductions on any impacting tag. This would include established tags, tags with an increase in mw volumes and incremental tags of energy.

With the Proposal outlined, the CAISO will procure energy on a 15 minute basis, meaning they would need the flexibility to adjust tags and allow market participants to submit incremental tags.

- With the USF process not being a 15 minute evaluation, how does the CAISO envision the hourly USF process to work in harmony with the CAISO 15 minute procurement process?

#### **CAISO Response**

If the USF is known prior to running of the first binding 15 minute interval (T-37.5), then an hourly blocks 15 minute self schedule would be adjusted and there would be no deviations settled at the RTD price. See excel spreadsheet.

#### **Tagging**

Currently it is unclear how the CAISO is defining a “transmission tag” for the purposes of the hour-ahead process. The CAISO should clearly define what a “transmission tag” is and determine if existing functionality is usable as suggested. Tagging, tagging timelines, approvals and all aspects of submitting, evaluating and implementing a tag need to be thoroughly outlined and agreed upon at WECC and the CAISO prior to the Proposal being finalized.

#### **CAISO Response**

The ISO is seeking to honor existing tagging practices in the WECC and is participating in the WECC 15 minute taskforce and will reflect any tagging requirements in the final design. This is not a requirement for a capacity tag but rather a normal energy tag with the energy profile matching the corresponding market schedules.

#### **Observations & Questions**

With the guiding principles the CAISO describes its reliance on price signals to incent behavior.

- With the Straw Proposal and the encouragement of self-schedules to facilitate a “static-like” hourly schedule, will the CAISO analyze the potential for incremental non-market solutions and exceptional dispatch?
  - With the encouragement of self-scheduling as proposed, would the CAISO be advocating for schedules to be entered into the system uneconomically, or that are not economically rational?
- Will the CAISO analyze the potential unintended uplift charges associated with the lack of flexibility of self-schedules?

#### **CAISO Response**

It is ISO's direction to encourage more and more economic participation. The use of self-schedules for hourly block schedules does not decrease flexibility to the ISO more than existing HASP schedules.

The CAISO states the desire to not "re-invent" and intends to leverage design and experience of other ISOs/RTOs.

- Has the CAISO researched any success or failures within other ISOs/RTOs surrounding 15 minute scheduling?
- Has or will the CAISO research whether other ISOs/RTOs settle intertie products by using certain components of an LMP in one market run (i.e. congestion) and other components in a separate market run (i.e. energy & losses) to determine a single financial obligation?
- Have other ISOs/RTOs considered and/or implemented a similar 15 minute market design based on a transmission bid at their interties?

#### **CAISO Response**

The ISO is seeking to maximize the use of existing CAISO market functionality and market design elements. The ISO does evaluate the market design of other ISOs/RTOs, but does recognize that changes in the CAISO market are not dependent upon how other ISOs/RTOs have implemented various measures.

With the existing Proposal, does the CAISO characterize the implementation of the new "product," within the hour-ahead process, as a firm 15 minute call or put option based on a T75 minute transmission bid?

#### **CAISO Response**

The transmission reservation allows hourly block energy schedules. For resources, seeking to be economically scheduled in the 15 minute market, the transmission reservation protects their average advisory energy schedule exposure to changes in the relevant direction of the scheduling limit shadow cost. It is a transmission right in the direction of congestion and a scheduling obligation in the counter flow direction.

#### **Can bids submitted in the T75 timeframe be accepted in the 15 minute process**

The CAISO's Proposal explains that a T75 transmission bid, accepted or not accepted, will be analyzed in the 15 minute market for energy procurement. With the Proposal suggesting a potential settlement of the congestion component based on the hour-ahead process and the energy and losses component based on the 15 minute process, can bids submitted in the T75 timeframe be accepted in the 15 minute process, even though the result is uneconomical?

#### **CAISO Response**

In the 15 minute market it is possible based upon the multi interval optimization – that is the resource was economic across the optimization horizon, but not in the binding 15 minute interval. This is similar to internal resources in RTD. This is why we provide BCR.

#### **Changes in policy or settlement processes**

Will the CAISO address and outline changes in policy or settlement processes

for the following (if necessary):

- eTagging timeline & forfeiture rule
- CRR forfeiture rule
- Declined dispatch – Is declined dispatch applicable if the hour-ahead process is truly a “transmission reservation?”

**CAISO Response**

The ISO will honor WECC tagging timelines. The ISO currently is not considering changes to the CRR clawback. The ISO requested comments on the need for the HASP schedules decline charge under the new market design. It should be noted that several participants have highlight the need for some sort of uninstructed deviation penalty or similar mechanisms.

Company	Date	Submitted By
Western Power Trading Forum	November 16, 2012	Ellen Wolfe, Resero Consulting, ewolfe@resero.com, 916-791-4533

**General Policy Questions**

The design could instead include an option to hold an SC’s schedule constant across the hour while allowing an economic bid for such a block schedule. Could the ISO please discuss its consideration of this option, including what mechanisms it considered for how such an economic block schedule bid could be treated and the pros and cons of including such a feature in the market design?

**CAISO Response**

This is part of the proposed design using inter-temporal constraints for hourly block intertie bids that would constrain the four 15-min Energy schedules in the HASP hour to be equal.

**Settlement Provisions Under the CAISO’s 15-Minute Scheduling Regime**

Can you please provide one or more examples of what parts of how one’s intertie bid will be evaluated in the RTUC if they are awarded an hourly transmission reservation? For example if I bid to sell power in to the ISO at \$30 per MW, and I’m awarded a transmission reservation where congestion is \$5 (with a \$40 LMP), will my \$30 bid be considered in its entirety in the RTUC intervals? And if I receive an award in one or more of the RTUC intervals what will I be paid? Will I be paid the RTUC LMPe + the RTUC LMPloss + (the RTUC LMPcongestion cost– HA LMPcongestion cost), or...?

**CAISO Response**

See posted spreadsheet.

**Hourly transmission reservation costs**

The ISO suggested that hourly transmission reservation costs would not be refunded even if another participant covered the congestion of released capacity as a result of the RTUC run. Has the ISO re-thought that? If so, can you please offer any revised ideas? If not, can you provide examples of settlements implications for the ISO for both a participant paying for congestion on an hourly basis and a participant being paid for counterflow capacity (assuming there would be such an outcome)?

**CAISO Response**

While there is a cost that could be incurred if a resource does not utilize their full transmission

reservation, there is also a benefit that the shadow cost will not be higher for the MW quantity awarded a transmission reservation in a previous market.

The transmission obligation does allow for a payment based upon the import/export providing counterflows. The obligation requires the import/export to schedule in the next market.

#### **What performance obligations would apply to the T-75 transmission award?**

What performance obligations would apply to the T-75 transmission award and the 15-minute energy schedule awards? For example, how does the ISO expect the intent tariff provisions and the performance rules change under the ISO's proposal? For example, currently non-performance between HASP and RTD is allowable up to a threshold... 300mws or 10% per direction. With the process being advisory and a transmission procurement process, how will this work and what is the obligation? What declined dispatch award provisions is the ISO envisioning under 15-minute scheduling? Will the eTagging rule be modified, and if so, how?

#### **CAISO Response**

The ISO is considering the need for an uninstructed deviation penalty or some other settlement mechanism.

#### **Protect self-schedules**

How does the CAISO propose to protect self-schedules? E.g., what penalty price would be applied during T-75 run and during the RTUC runs?

#### **CAISO Response**

The ISO would use the same penalty prices as today. Specifically, Energy self-schedules with a TR award will have the HA Price Taker (PT) scheduling priority. Energy self-schedules without a TR award will have the Lower Price Taker (LPT) scheduling priority.

#### **Generator's 15 minute settlement and their 5-minute dispatch instructions**

What will be the relationship between the Generator's 15 minute settlement and their 5-minute dispatch instructions (assuming that there will still be 5-minute dispatch instructions)?

#### **CAISO Response**

A generator would be settled at the 15 minute price for any deviations from day-ahead. Any deviation from the 15 minute schedule would be settled at the 5 minute RTD price. There will still be 5 minute dispatch.

#### **Virtuals be cleared in RT**

How will virtuals be cleared in RT; at the weighted average of the 4 RTUC LMPs, or the simple average of the RTUC LMPs, or...? (Would the ISO also please consider the implications of a virtual settlement that differs from the energy + transmission reservation settlement?)

#### **CAISO Response**

This is irrelevant as the MW quantity is the same in each 15 minute interval. So the weighted average price and the simple average price are the same.

<b>Higher levels of self-scheduling</b>
What analysis or other consideration approaches has the ISO given to ensure address the extent to which this proposal could result in higher levels of self-scheduling and the impacts that may result from higher levels of self-scheduling? Similarly has the ISO considered what impact the proposal may have on liquidity at the interties?
<b>CAISO Response</b>
There is no difference in flexibility from self-scheduling hourly block schedules in the 15 minute market and the current HASP hourly schedules. To the extent participants take advantage of the 15 minute market, flexible scheduling will increase on the interties.
<b>Scheduling Provisions and Coordination with Neighboring BAAs</b>
How specifically does the ISO anticipate static schedules will tag their deliveries when the level varies over the hour? For example, does the ISO envision a top-of-the-hour tag for the first RTUC award followed by tag adjustments for subsequent RTUC intervals? Alternatively, Can market participants enter “transmission only” tags? Is this widely accepted?
<b>CAISO Response</b>
A static schedule is the same as an hourly block schedule. The resource’s transmission reservation would equal the advisory energy schedule. The resources advisory energy schedule would be flat across the hour and self-scheduled in the 15 minute market. The resource could tag the whole hourly schedule at T-20 as is done today. ISO does not contemplate a “transmission only” tag. The tag is still a normal energy tag with the energy profile matching the corresponding market schedule.
<b>Transmission tags</b>
If “transmission tags” are acceptable, is it feasible and/or reasonable for market participants to have 2.5 minutes to adjust the energy portion of a tag? Does this allow sufficient time for BA’s and transmission providers to review and “accept” the tag adjustments? Does this provide for ample checkout time for BAs?
<b>CAISO Response</b>
We are seeking to balance starting/finishing the binding 15 minute market optimization as close as possible to flow while still honoring the 20 minute tagging timeline.
<b>Managing its 15-minute market with this disparity throughout WECC</b>
Differing BAAs seem to be considering different options for scheduling, with some considering 15-minute scheduling and some not. How does the ISO envision managing its 15-minute market with this disparity throughout WECC?
<b>CAISO Response</b>
Imports from source BAAs that do not allow 15 minute schedule will have to schedule as hourly blocks. Exports to sink BAAs that do not allow 15 minute schedules will have to schedule as hourly blocks.
<b>Provide Tagging Examples</b>
Can the ISO please provide a tagging example where a certain transmission reservation is awarded in the

T-75 process and then different and varying energy is awarded in the RTUC process? Please provide an example of the hour-ahead and 15-minute tags that the ISO expects would be generated.

**CAISO Response**

See excel spreadsheet examples.

**Timeline**

Other WECC BAAs seem to be on a longer timeline for considering 15-minute scheduling, whereas the ISO has a fairly aggressive schedule for moving to its 15-minute market. How does the ISO anticipate its more aggressive schedule will “jive” with the balance of the WECC’s consideration?

**CAISO Response**

We believe that hourly block schedules will remain in WECC. So regardless of the speed of the ISO initiative, the market design will still need to provide hourly block schedules.

**Unscheduled flow practices**

How would the unscheduled flow practices change to account for the variations in intertie schedules on 15-minute bases? Or if the ISO intends that USFs would still be determined on an hourly basis within the west, what would be the practical impacts of having USFs not reflect loop flows as the 15-minute schedules varied from the hourly flow assumptions?

**CAISO Response**

If known prior to the start of the binding 15-minute market optimization (37.5 minutes prior), the self-schedule of an hourly block schedule would be adjusted to reflect USF.

**PIRP-Related Questions**

When does the CAISO intend to eliminate PIRP? On a going forward basis or will resources that currently participate in PIRP be able to stay in PIRP through their contract terms?

**CAISO Response**

The ISO prefers not to provide grandfathering.

The prior proposal for DEC bidding allowed PIRP resources that submit DEC bids to remain in PIRP unless the bid cleared the market. Depending on answer above, does this proposal still stand?

**CAISO Response**

We would allow a VER who self-schedules their expected output to also provide the market with a decremental bid for use in RTD. This is independent of whether PIRP monthly netting exists.