



California ISO
Your Link to Power

**Key Elements for the
Conceptual Proposal
for
Convergence Bidding
in the MRTU Markets**

- ***Cost Allocation for Virtual Bids***
- ***Other ISOs' Credit Policy for Virtual Bids***

May 31, 2007

Key Elements for Convergence Bidding

Table of Contents

| | | |
|-----|---|----|
| 1 | Background and Purpose of this Issues Paper..... | 3 |
| 1.1 | Previous Stakeholder Meetings..... | 4 |
| 1.2 | Design Elements Already Reviewed within this Stakeholder Process | 5 |
| 1.3 | Design Elements to be Determined..... | 5 |
| 2 | Proposed Process to Continue the Stakeholder Process on Convergence Bidding..... | 6 |
| 3 | Review of Settlement Charge Types and Possible Application to Virtual Transactions..... | 7 |
| 3.1 | Review of Settlement Charge Types and Possible Application to Virtual Transactions | 7 |
| 3.2 | Initial Conceptual Proposal for Allocating Costs Related to IFM and RUC Charges for Virtual Transactions..... | 8 |
| 3.3 | Initial Conceptual Proposal for Allocating Costs Associated with Ancillary Services for Virtual Transactions..... | 10 |
| 3.4 | Other Potential Charges or Credits | 10 |
| 3.5 | Comparison with Other ISO Charges Allocated to Virtual Transactions | 12 |
| 4 | Review of other ISO Credit Policies related to Convergence Bidding..... | 13 |
| 4.1 | Potential Credit Issues to be Addressed | 14 |

1 Background and Purpose of this Issues Paper

Convergence Bidding is a mechanism whereby market participants can make financial sales (or purchases) for energy in the Day Ahead market, with the explicit requirement to buy back (or sell) that energy in the Real Time market, thereby arbitraging their expected differences between Day Ahead and Real Time prices.

As explained in the ISO's most recent "Market Initiatives Roadmap¹," Convergence Bidding is considered a mandated enhancement of the MRTU markets because, under FERC's September 21, 2006 MRTU Order, the ISO must implement Convergence Bidding within twelve months after MRTU startup.²

Convergence Bidding would be the first major market enhancement after MRTU startup. Although the CAISO and market participants are intensely focused now on the smooth startup of the MRTU markets on February 1, 2008, the CAISO must begin assessing the functional requirements and technical specifications for Convergence Bidding well in advance of date when virtual bidding would be permitted in the CAISO's markets. Thus the CAISO is seeking focused stakeholder input over the next three months to complete the design elements for Convergence Bidding so that the necessary software features and business processes can be developed to meet a reasonable implementation schedule.

The CAISO and stakeholders began a public process in 2006 to develop the conceptual policy for convergence bidding. This paper seeks to restart this policy development effort with the targeted goal for completing a conceptual design framework by mid-August, which would be presented to the CAISO Board of Governors in September and, upon their approval, incorporated into tariff language that would be filed at FERC in October, 2007. Additional details and proposed milestones for this stakeholder process over the next three months are listed in Section 2.

This paper resets the Convergence Bidding stakeholder discussion by focusing on two key elements: 1) the allocation of charges that should be applied to virtual transactions, and 2) credit requirements for virtual transactions that are imposed by other ISOs. The CAISO will facilitate a short discussion on these issues during the June 6 stakeholder / MSC meeting. (Please see the CAISO calendar for further details about this meeting.)

Initial stakeholder written comments on this paper and the ensuing discussion on June 6 are welcome. The CAISO particularly encourages comments on the following topics, which will be reviewed further at another stakeholder engagement tentatively set for June 28:

¹ November 28, 2006 "Revised Draft of the Three-Year Market Initiatives Roadmap" located at: <http://www.caiso.com/18bc/18bc8d6230fb0.pdf>

² Paragraphs 447-452 of the September 21, 2006 FERC Order Conditionally Accepting the CAISO Tariff Filing to Reflect MRTU. This FERC Order also directs the ISO to address the potential for underscheduling in the Day Ahead market through "interim measures" until Convergence Bidding is in place, so there is linkage between rules to deal with the potential economic incentive for LSEs to underschedule in the Day Ahead market -- which are currently being developed in an on-going stakeholder process -- and the implementation of Convergence Bidding.

California ISO

- The proposed stakeholder process to complete the Convergence Bidding design.
- Cost allocation features that are explained within this paper.
- Credit requirements for virtual transactions and the credit policies followed by other ISOs.
- Other issues that should be addressed as part of the Convergence Bidding design.

Please submit any written comments by June 13 to convergencebidding@caiso.com.

The CAISO will be requesting additional stakeholder comments in early July, following a more extensive discussion of these topics.

The rest of this paper is organized in the following way:

Sub-sections 1.1, 1.2 and 1.3 review previous stakeholder discussions on Convergence Bidding and propose topics for future discussion.

Section 2 proposes a process for stakeholder review of the Convergence Bidding design, with key milestones identified.

Section 3 reviews potential settlement charges and allocation of costs to virtual transactions. An appendix includes a list of settlement charge types with an explanation of their applicability on virtual transactions. Stakeholder discussion on these features was started but not completed in 2006, so this paper seeks to reset the effort to gain better understanding and possible consensus on the specific charge types that should be assessed on virtual bids and transactions.

Section 4 reviews credit policies for virtual transactions that are currently practiced by other ISOs, so that the CAISO and stakeholders can have a better understanding of these benchmarks as we design credit and collateral requirements on virtual bidders that are appropriate for the CAISO and its market participants.

1.1 Previous Stakeholder Meetings

The economic logic of Convergence Bidding, the practical experience of other ISOs with virtual bidding, and certain features of the CAISO's design for CB have already been discussed in various stakeholder forums throughout 2006.

- Market Issues Forum ("Tutorial and Panel Discussion") – June 13, 2006
- "Market Initiatives Stakeholder Meeting" -- July 19, 2006
- "Market Initiatives" Stakeholder Meeting – August 17, 2006
- Stakeholder conference calls (two hours each) with staff from NYISO, ISO-NE and PJM -- September 6 and 8, 2006
- Stakeholder conference call -- October 30, 2006
- "Market Initiatives" Stakeholder Meeting – November 29, 2006
- Market Surveillance Committee (MSC) meetings – May 31, August 8, September 18 and November 13, 2006.

Documents relevant to these meetings and discussions are located at:

- Convergence Bidding Work Group: <http://caiso.com/1807/1807996f7020.html>
- Market Initiatives Stakeholder Meetings: <http://caiso.com/1822/1822931f287d0.html>
- MSC Meetings: <http://caiso.com/pubinfo/BOG/documents/market/msc/index.html>

1.2 Design Elements Already Reviewed within this Stakeholder Process

In previous meetings, conference calls, White Papers and presentations, the CAISO has discussed and largely resolved with stakeholders the following core elements of the Convergence Bidding design:

- **Explicit virtual bidding** – virtual bids will be flagged so that virtual and physical bids can be easily differentiated throughout the bidding process.
- **Initial Convergence Bidding restricted to the LAPs** -- both virtual supply bids and virtual demand bids will be submitted at the LAP-level only upon the initiation of Convergence Bidding.

This feature has been the focus of strong debate during the discussions conducted in 2006. Stakeholder written comments on this feature as well as the CAISO's conclusions are explained in the documents related to the October 30, 2006 stakeholder conference call located at: <http://www.caiso.com/1807/1807996f7020.html>.

The CAISO recognizes that some stakeholders would prefer more granular virtual bidding at the initial implementation. The CAISO hopes that these stakeholders can generally accept this initial phase-in of convergence bidding while working constructively toward a stronger stakeholder consensus for more granular virtual bidding.

- **Load Distribution Factors for Virtual Bids that are Identical to Physical Bids** – LDFs for virtual bids will be the same as physical bids in the relevant markets.
- **Key Market Monitoring Capabilities** -- As a prerequisite to more granular virtual bidding, the CAISO's Department of Market Monitoring recommends that it should have the capability to quickly re-run market results (with and without virtual bids).

1.3 Design Elements to be Determined

Additional key design elements were briefly discussed with stakeholders in 2006, but no firm conclusions were reached. In 2007 the design for Convergence Bidding has been (until now) effectively put on hold because the CAISO and stakeholders have been focused on finalizing CRR rules and other pressing MRTU implementation matters.

Over the next three months the CAISO will focus on the following features to complete the design phase for implementing convergence bidding in the MRTU markets:

- **Settlement of Virtual Transactions**
 - Review of all settlement charge types

- Review of key cost allocation and unit commitment charges (continuing previous stakeholder discussions)
 - IFM / RUC uplift charges
 - Charges related to Ancillary Services

- **Credit / Collateral Requirements for Virtual Transactions**
 - Review of Credit Policies related to virtual bidding at other ISOs
 - Options and Key Issues for the CAISO credit requirements for virtual bidding
 - Straw Proposal on CAISO credit requirements for virtual bidding

- **Other Market Mitigation Features**
 - Restrictions on Bid Price Quantity Pairs
 - Allowing price taker virtual bids

- **Implementation Analysis**
 - Functional Assessment
 - Technical Requirements / software specifications
 - Virtual Bid-to-Bill example and analysis

2 Proposed Process to Continue the Stakeholder Process on Convergence Bidding

| Date | Activity or Milestone |
|---------|---|
| May 31 | Posting of <u>Issues Paper</u> that includes: <ul style="list-style-type: none"> ○ Review of settlement charge types that may be applicable to virtual transactions ○ Review of potential cost allocation features dealing with IFM / RUC charges and A/S charges on virtual transactions ○ Review of other ISO credit practices for virtual transactions |
| June 6 | <u>Joint Stakeholder / MSC Meeting to review May 31 Convergence Bidding Issues Paper</u> <ul style="list-style-type: none"> ○ Discussion of key cost allocation features for virtual bids ○ Other ISO credit practices for virtual bidding |
| June 13 | <u>Stakeholder written comments due:</u> convergencebidding@caiso.com |

| | |
|--------------------------------------|---|
| June 21 | <p>Post White Paper</p> <ul style="list-style-type: none"> ○ Further review cost allocation proposal and consider revisions and clarifications ○ Options on CAISO credit policy for Convergence Bidding |
| June 28 <i>(tentative)</i> | <u>Stakeholder engagement (meeting or conference call) to review White Paper</u> |
| July 6 | <p><u>Stakeholder written comments due:</u> convergencebidding@caiso.com</p> |
| July 19 | <p>Posting of Straw Proposal</p> <ul style="list-style-type: none"> ○ Straw Proposal on CB Credit Policy ○ Review ISO proposals for all elements of conceptual design ○ Review virtual bid-to-bill example in CAISO's MRTU markets ○ discuss implementation and functionality assessment |
| July 26 <i>(tentative)</i> | <u>Stakeholder meeting to review Straw Proposal</u> |
| August 3 <i>(tentative)</i> | <p><u>Stakeholder written comments due:</u> convergencebidding@caiso.com</p> |
| Mid-August <i>(to be determined)</i> | Posting of ISO's Final White Paper |
| Mid-August <i>(to be determined)</i> | Stakeholder Conference Call to review final policy statement |
| September 6-7 | ISO Board Meeting |

3 Review of Settlement Charge Types and Possible Application to Virtual Transactions

3.1 Review of Settlement Charge Types and Possible Application to Virtual Transactions

In a stakeholder discussion last November, stakeholders suggested a comprehensive review of all MRTU charge types with consideration for how virtual transactions might be impacted. The CAISO has prepared a spreadsheet (posted as a separate document) that categorizes various settlement charges and suggests whether or not these charges have applicability to virtual bidding.

The following sections deal with more complex charge types related to uplift charges in the IFM and RUC, as well as charges associated with Ancillary Services.

3.2 Initial Conceptual Proposal for Allocating Costs Related to IFM and RUC Charges for Virtual Transactions

As a preliminary conceptual proposal, and to further stakeholder discussion on these cost allocation charges, the CAISO offers the general concept that virtual demand bids should be charged uplift costs related to the IFM and virtual supply bids should be charged uplift costs related to RUC.

This general concept is explained by individual charge types in the following sections.

3.2.1 Bid Cost Recovery Charges

Under MRTU all supply resources are eligible for Bid Cost Recovery (BCR) which allows resources to recover their Start-Up Costs, Minimum Load Costs, and Energy and Ancillary services bid costs to the extent those costs are not covered by LMP and AS revenues from the market.

Generating Units and Resource Specific System Resources that are committed by the CAISO in the IFM, RUC, or RTM are eligible to recover Start-Up Costs and Minimum Load Costs as well as Bid Costs for Energy and Ancillary Services. Supply Resources that are self-committed are eligible to recover only Bid Costs for Energy and Ancillary Services. The funds needed to compensate eligible resources for their Bid Cost Recovery are collected through the IFM and RUC Tier 1 and Tier 2 Uplift charges, and RTM Uplift charge, all of which are charged to demand (with exports being exempt from RUC uplift charges.)

Virtual transactions will be cleared in the Day-Ahead IFM and will have an impact on the commitment of physical generating units in the IFM and RUC processes. As an initial conceptual proposal intended to generate further discussion, the CAISO proposes that IFM and RUC tier 1 charges be allocated to net virtual demand and net virtual supply as described below, and that virtual bids be exempt from RTM Uplift charges under the single Tier RTM BCR cost allocation approach currently filed.

Since the allocation of BCR costs will be based on the net virtual transactions, a virtual bidding market participant will either be paying a portion of IFM BCR costs or RUC BCR Costs in the Day-Ahead market but not both at the same time.

3.2.1.1 IFM Bid Cost Recovery Tier 1 Charges

Charge Type 6636 includes costs of make whole payments for start-up, minimum load and bid costs for resources committed in the IFM. Resources are committed based on bid in Demand.

The CAISO proposes that CT 6636 be allocated to both Cleared Demand Bids as well as Cleared Net virtual demand bids (i.e., virtual demand minus virtual supply volume if the net is positive, otherwise 0 MW.)

Resources will be committed in IFM based on cleared physical demand bids as well as cleared net virtual demand bids. Virtual demand will have an impact on more units committed in the Day-Ahead IFM which will result in an increase in IFM BCR Uplift; therefore virtual demand should be added as a billing determinant to charge type 6636

3.2.1.2 IFM Bid Cost Recovery Tier 2 Charges

Charge Type 6637 includes costs for any remaining IFM uplift not covered in Tier 1.

The CAISO proposes to continue to allocate CT 6637 to Measured Physical Demand. Since virtual transactions do not change Measured Demand there will be no additional allocation.

3.2.1.3 Day-Ahead Residual Unit Commitment (RUC) Tier 1 Charges

Charge Type 6806 includes costs for make whole payments for resources committed to meet the difference between bid in demand and the CAISO Forecast of Demand.

The CAISO proposes that CT 6806 be allocated to SCs in proportion to their net negative load deviation which would include metered CAISO Demand that consumes more in RT than is scheduled Day-Ahead as well as net virtual supply (i.e., virtual supply minus virtual demand volume if the net is positive, otherwise 0 MW.)

Load not bid into the Day-Ahead market and virtual supply result in additional resources being committed in the RUC process; therefore virtual supply should be added as a billing determinant to charge type 6806.

3.2.1.4 Day-Ahead Residual Unit Commitment (RUC) Tier 2 Charges

Charge Type 6807 relates to costs for remaining RUC Uplift not covered in Tier 1.

The CAISO proposes that CT 6807 continue to be allocated to Physical CAISO Metered Demand. Since virtual transactions do not change Measured or Metered Demand there will be no additional allocation for virtual transactions.

3.2.1.5 Real-Time BCR Uplift Charges

Charge Type 6678 includes costs for make whole payments for resources committed in the Real-Time Market.

Under the initial single tier allocation, the CAISO recommends that RTM Uplift be allocated to Measured Demand only (which would not include virtual bids.)

[The CAISO suggests that if there were a possibility – sometime in the future, following a process for stakeholder input -- where the CAISO might move toward a two tier allocation for Real-Time Uplift charges to allocate costs for RTM uplift, then Tier 1 charges could be allocated to SCs in proportion to their net negative deviations which would include physical load that consumes more in RT than was purchased in the DAM and virtual supply.

Since resources will be committed in Real-Time to meet the Real-Time forecasted demand as well as to provide additional RT A/S and virtual supply results in a short position in RTM, virtual

supply could be added as a billing determinant to charge type 6678 tier 1 only if a two tier charge is implemented.]

To summarize: under current settlement charge types, RTM Uplift charges should be allocated to Measured Demand only.

3.3 Initial Conceptual Proposal for Allocating Costs Associated with Ancillary Services for Virtual Transactions

3.3.1 Ancillary Services Cost Allocation

This involves Charge Types 6090, 6196, 6596, 6696.

The CAISO is responsible for ensuring there are enough Ancillary Services which includes Regulation Up, Regulation Down, Spinning Reserve and Non-Spinning Reserve to satisfy both WECC and NERC requirements. Resources that provide Ancillary services are paid the Ancillary Services Marginal Price (ASMP) at the resource location. Costs for Ancillary Services procured are charged to load based on the metered load share of the A/S obligation. The CAISO will calculate the SCs Ancillary Services obligation for each service across IFM, HASP, and Real-Time markets based on metered demand and allocate the cost for each service using the user rate.

The CAISO proposes that no tier 1 or tier 2 Ancillary Services costs be allocated to virtual transactions. A/S is purchased based on the CAISO forecast – thus, virtual transactions will not directly impact the quantity of A/S procured.

Tier 2 A/S costs result from the revenue non-neutrality that results from the procurement of A/S using the CAISO Demand Forecast and the calculation of load obligation using actual metered demand. Although it is possible that virtual supply bids could create some cost impact in the procurement of Ancillary Services, such impact is likely to be very minor. Thus the CAISO suggests that exempting virtual supply from Tier 2 A/S costs may be warranted for simplicity and justifiable because there would be no major impact upon other market participants.

3.4 Other Potential Charges or Credits

3.4.1 Allocation of IFM Marginal Losses Surplus (MLS) Credit

Charge Type 6947 includes the surplus resulting from difference between marginal and average loss charges.

The CAISO proposes that CT 6947 is not applicable to virtual transactions and to continue to apply the MLS credit to Measured Demand.

Since virtual transactions occur in buy/sell pairs and are closed out with an automatic countervailing trade in real-time, they are paid or charged the LMP which includes the energy, congestion and losses component in the Day-Ahead Market and are in turn charged or paid the

LMP in Real-Time Market. Since these transactions in effect net to zero, and with price convergence the expected applicable marginal loss component of the LMP at the relevant location (the LAP) is expected to be on the average the same in the day-ahead and real-time, virtual transactions are not affected by the over collection of marginal losses.

3.4.2 Real-Time Imbalance Uplift Charges

Charge Type 6477 includes the assessment of Charges or Payments for the net sum of Settlement Amounts for IIE, UIE, and UFE, less Real-Time Congestion Offset does not equal zero.

The CAISO proposes that CT 6477 is not applicable to virtual transactions and should continue to apply this credit or charge to Measured Demand.

3.4.3 Real-Time Congestion Off-Set

Charge Type 6774 rebates HASP and RT Congestion costs to SCs.

The CAISO proposes that CT 6744 is not applicable to virtual transactions and should continue to apply this credit to Measured Demand.

3.4.4 Grid Management Charge (GMC)

The GMC is an administrative charge that is used to fund the operation and services of the CAISO.

The composition of the GMC under the MRTU markets is the focus of a separate stakeholder process. Virtual transactions have not yet been considered within that stakeholder process though it is anticipated that further changes in the GMC will take place for 2009 that could incorporate administrative charges on virtual bidding.

Thus the CAISO invites comments in this forum on alternative methods of assessing the CAISO's administrative costs to virtual bidding transactions. The CAISO will discuss at a later time ideas for resolving how potential changes to the GMC would be filed at FERC.

The CAISO presents the following ideas for consideration:

- Assess a processing or transaction fee for each supply or demand bid submitted. This charge would apply regardless of whether the bid was accepted. Since a primary driver of the administrative costs of virtual bidding would be the cost of systems and maintenance of those systems to process the bids, this could arguably adhere most closely to cost-causation principles.
- Another method would be to assess GMC only on the cleared bids or offers (on a per bid basis), or to the volume of the cleared supply or demand bids (a volumetric basis). This would be analogous to stock market transaction in which no commission is charged unless the offer to buy or sell is executed. The CAISO

currently assesses the volumes of market transactions in this manner. Currently, the Market Usage GMC charge is only assessed if the bid or offer is cleared (i.e., awarded).

- A third method would be a hybrid of the first two. Each bid or offer could be assessed GMC. If a bid or offer is cleared, GMC could be assessed on the volumes of the bid or offer. PJM assesses its Schedule 9-2 costs on FTR activity and Schedule 9-3 on market activity in this manner.

These potential methods differ primarily in the impact of the charges on different groups of market participants. Entities that schedule many small bids that are not accepted may face higher charges under the first method than the second. Entities that schedule large bid volumes (regardless of the number of bids) that are accepted will be impacted more by charges under the second method.

3.5 Comparison with Other ISO Charges Allocated to Virtual Transactions

The following chart compares the initial CAISO proposal for specific cost recovery and reliability charges that is described above with the current practices of other ISOs. Stakeholders are encouraged to help clarify or add to this comparison.

| | PJM | NYISO | MISO | ISO- NE | CAISO (proposed) |
|----------------------|--|---|--|---|--|
| Day-Ahead BCR | Yes - charged to virtual demand for resources committed based on bid in Demand | No charges to VT for resources committed based on bid in Demand | Yes – charged to virtual demand for resources committed based on bid in demand | Yes - charged to virtual Demand for resources committed to meet bid in demand | Yes – IFM BCR Tier 1 to virtual demand |
| | | Yes – charged to virtual supply for resources committed based on NYISO forecast | | | Yes – RUC BCR Tier 1 to virtual supply |
| | | | | | No IFM or RUC tier 2 costs allocated to VT |

| | | | | | |
|----------------------|---|-----------------|---|---|---|
| Real-Time BCR | Yes - charged to both Virtual Demand and Virtual Supply to cover costs for resources committed to meet forecasted RT Demand | No charge to VT | Yes - first pass charged to virtual supply for resources committed to meet forecasted RT Demand | Yes - charges to both virtual supply and virtual demand for resources committed to meet forecasted RT Demand | Yes- charge tier 1 costs only to virtual supply if two tier approach is adopted |
| | | | No second pass costs allocated to VT | | No charge to VT if single tier charge type remains |
| A/S Costs | No charge to VT | No charge to VT | No charge to VT | Yes DAM A/S costs charged to virtual demand RT A/S costs charged to both virtual demand and virtual supply | No charge to VT |

4 Review of other ISO Credit Policies related to Convergence Bidding

This section is intended to reset the discussion on credit and collateral requirements as they relate to virtual bids.

A spreadsheet matrix summarizing the credit policy provisions relating to virtual bidding at NYISO, PJM, ISO-NE and MISO is presented in a separate attachment to this paper. This information may provide insights into the key policy decisions that should be addressed within the CAISO's development of credit policy for convergence bidding.

In addition, the sub-section below identifies certain elements that may need to be considered in the CAISO's development of credit policy for convergence bidding. The CAISO welcomes initial stakeholder comments on these or other elements. Further stakeholder discussion on potential

changes to the CAISO's credit policy as it relates to convergence bidding will be conducted in late June.

4.1 Potential Credit Issues to be Addressed

Currently, entities participating in the CAISO markets must maintain an Aggregate Credit Limit (Unsecured Credit Limit plus posted collateral) in excess of the Estimated Aggregate Liability (EAL) at all times. Financial amounts (due to CAISO or due from CAISO) related to convergence bidding could become a component of the EAL. The EAL then would contain all amounts related to convergence bidding, both for transactions that have already occurred, and an amount to cover pending/prospective trades. Specifically, the EAL will need to be revised to include amounts related to convergence bidding as follows:

1. The value of a given Virtual Energy Charge/Credit that has been invoiced, but not yet paid.
2. The value of a given Virtual Energy Charge/Credit that has been settled and/or calculated, but not yet invoiced.
3. The value of Virtual Energy Charge/Credit in an exposure window of a limited number of days. This will likely be calculated as the product of:
 - a Participant's daily Virtual MWh Limit
times
 - b. A reference price = the highest differential between the Day-ahead and Real-Time Locational Marginal Prices at the XXth percentile over the previous XX months.
times
 - c The number of days in the Virtual Transactions Estimated Exposure Window (for example, 2 Days).

Important policy considerations in the design of the credit policy for Convergence Bidding relate primarily to the third item above.

Based on the review of credit practices of these peers (which is an attached document), the CAISO suggests the following additional policy issues related to credit for convergence bidding that may need further examination. Again, stakeholders are welcome to offer initial written comments on these suggested policy issues, or wait until more extensive review and discussion is conducted at another stakeholder meeting in late June.

ISSUE

USED AT:

- | | |
|---|--------------------|
| A. Proxy / reference price for difference between DA and RT energy prices used to measure the exposure for credit purposes. | |
| i. How granular is this figure? | |
| 1. Single figure per MWh | MISO |
| 2. Different figure for different paths / etc. | ISO-NE, PJM, NYISO |
| ii. How often is the figure reset? | |
| 1. Every two months | NYISO, PJM |
| 2. Monthly | ISO-NE |
| 3. Annually | MISO |

- iii. What data will be used to calculate the proxy?
 - 1. initially
 - 2. ongoing
- iv. What risk level shall CAISO use to determine the potential variance between DA and RT prices?
 - 1. 97% ISO-NE, NYISO, PJM
 - 2. 50% MISO
 - 3. other

- B. How shall over the credit limit bids be rejected?
 - i. All PJM (market participant then re-enters bids)
 - ii. Some....using appropriate defined methodology such as LIFO. ISO-NE
 - iii. Some....unspecified method. MISO

- C. How shall the limit for virtual bids for a given market participant be set?
 - i. Fixed amount that is changed based on consultation with CAISO credit and the market participant?
 - ii. Dynamic amount that is based on a continuous comparison of the EAL to the credit limit for each market participant?

- D. How many days shall be assumed for the Virtual Transactions Estimated Exposure Window?
 - i. Peers use 1-3 days.
 - ii. FERC rejected four days for PJM and six days for MISO
 - iii. Should be based on the risk and the actual exposure given CAISO timelines for bidding, and for collateral posting (may need to adjust CAISO's five day period)

- E. How are losses shared in the event of a default?
 - i. NYISO uses a different loss sharing approach for virtual transactions vs. other market transactions.
 - ii. If amounts are settled on the same invoices as other charges, CAISO will need to use the existing / same loss sharing approach as other charges, i.e. net suppliers in the month of the default are short-paid.

Convergence Bidding implementation also requires a review of other general credit provisions.

- A. Time permitted for required collateral posting.
 - i. one day NYISO, ISO-NE
 - ii. two days MISO
 - iii. three days PJM
 - iv. five days CAISO
- B. Frequency of credit adequacy check.
 - i. Daily NYISO MISO PJM
 - ii. Weekly CAISO currently
- C. Maximum amount of credit that may be used.
 - i. 100% MISO
 - ii. 90% CAISO requests more at 90%, but
Tariff allows 100% usage before rejection of bids.
 - iii. 85% PJM
 - iv. 50% NYISO (for virtual bids)