Meeting Objective

- To address refinements to the CRR Process

- The issues categories:
  - CRR-Related Credit Issues
  - Non-Credit Policy Issues
  - Non-Credit Business Process Issues
CAISO Stakeholder Process – CRR Enhancements – CRR-Related Credit Issues

We are here for CRR-Related Credit Issues

1. Issue ID Paper
2. Straw Proposal
3. Final Draft Proposal

Opportunities for Stakeholder Input

Board of Governors

Implementation

FERC
CAISO Stakeholder Process – CRR Enhancements – Non-Credit Issues

We are here for Non-Credit Issues

Opportunities for Stakeholder Input

1. Issue ID Paper
2. Straw Proposal
3. Final Draft Proposal

Board of Governors
FERC
Implementation
## CRR Credit Related Issue Proposed Time Table

<table>
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<tr>
<th>Date</th>
<th>Activity/Milestone</th>
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<tbody>
<tr>
<td>August 14</td>
<td>Publish Issue Paper</td>
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<tr>
<td>August 21</td>
<td>Stakeholder Conference call</td>
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<td>August 28</td>
<td>Comments Due on Issue Paper</td>
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<tr>
<td>September 1</td>
<td>Straw Proposal from CAISO</td>
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<td>September 8</td>
<td>Stakeholder Meeting at CAISO</td>
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<td><strong>September 15</strong></td>
<td><strong>Stakeholder Comments Due</strong></td>
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<td><strong>Then, for CRR-Related Credit Issues:</strong></td>
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<tr>
<td>September 22</td>
<td>Draft Final Proposal</td>
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<tr>
<td>Late September</td>
<td>Stakeholder Conference call</td>
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<td>October 29/30</td>
<td>BOG Decision</td>
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<td>November</td>
<td>FERC Filing</td>
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<tr>
<td>Time</td>
<td>Topic</td>
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<tr>
<td>1:00 - 1:10</td>
<td>Intro &amp; Objective</td>
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<td>1:10 – 1:40</td>
<td>Pre- Auction Credit Requirements</td>
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<tr>
<td>1:40 - 2:40</td>
<td>Liquidation Process of CRR Defaulting CRR Holders</td>
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<tr>
<td>2:40 - 3:00</td>
<td>Reevaluation of CRR Holding Credit Req. under Extra-Ordinary Circumstances</td>
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<tr>
<td>3:00 – 4:45</td>
<td>Non Credit Policy and Business Issues</td>
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<td>4:45 – 5:00</td>
<td>Questions</td>
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<td>Next Steps</td>
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Proposed Enhancements for CRR Credit Policy

Shucheng Liu, Ph.D.
Principal Market Developer

CRR Stakeholder Meeting
September 8, 2009
The ISO continues to enhance its CRR credit policy.

- Proposed enhancements are based on market operation experience and stakeholder feedback.

- The enhancements apply to the calculation of pre-auction credit requirement regarding:
  - Maximum credit exposure of a CRR bid
  - Bids for negative-valued CRRs
Comparison of existing and proposed methods for pre-auction credit requirement calculation:

- **Existing method**

\[
\text{Pre-Auction Credit Requirement} = \max\left[500,000, \sum_i \left( \max\left( \frac{\text{Bid Price}_i \times MW_i}{MW} \right) + \text{Credit Margin}_i \times \overline{MW}_i \right) \right]
\]

where:

- \( MW_i \) = is the maximum MW value of the bid for \( CRR_i \)
- \( MW_i \) = the MW value within the range of the bid curve for \( CRR_i \), i.e., \( 0 \leq MW_i \leq \overline{MW}_i \)
- \( \text{Bid Price}_i \) = the bid price ($/MW) corresponding to \( MW_i \) on the bid curve for \( CRR_i \).
Comparison of existing and proposed methods for pre-auction credit requirement calculation: (cont.)

- Proposed method

\[ Pre-Auction Credit Requirement = \max\{500,000, \sum_i \max(0, \text{BidPrice}_i \times MW_i) + \text{Credit Margin}_i \times MW_i\} \]

where

- \( MW_i \) is the maximum MW value of the bid for \( CRR_i \)
- \( MW_i \) is the MW value within the range of the bid curve for \( CRR_i \), i.e., \( 0 \leq MW_i \leq MW_i \)
- \( BidPrice_i \) is the bid price ($/MW) corresponding to \( MW_i \) on the bid curve for \( CRR_i \)
Maximum credit exposure calculation is improved with the proposed method.

- Maximum credit exposure is calculated using the same MW value for the total credit requirement
- Pre-auction credit requirement is reduced for some bids
- No additional financial risk is introduced
Pre-auction credit requirement for the bid for a negative-valued CRR is reduced.

- Excluding negative bid, but not the credit margin, in pre-auction credit requirement calculation
- Using auction winning value to meet holding credit requirement for the CRR
- Improving efficiency of collateral usage
- Implementation impacts
  - Modifying software of pre-auction credit requirement calculation
  - Changing related settlement processes
Example 1 – Bid for a positive-valued CRR

- Comparison of calculated credit exposure using the existing and proposed methods

<table>
<thead>
<tr>
<th>Bid Curve</th>
<th>Existing Method</th>
<th>Proposed Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bid Price ($/MW)</td>
<td>Credit Margin Exposure ($/MW)</td>
</tr>
<tr>
<td>0~5</td>
<td>15</td>
<td>75</td>
</tr>
<tr>
<td>5~20</td>
<td>13</td>
<td>260</td>
</tr>
<tr>
<td>20~35</td>
<td>7</td>
<td>245</td>
</tr>
<tr>
<td>35~50</td>
<td>3</td>
<td>150</td>
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</table>

- It is assumed that credit margin=$4/MW
Example 1 – Bid for a positive-valued CRR (cont.)

Existing Method

Proposed Method
Example 1 – Bid for a positive-valued CRR (cont.)

- Comparison of pre-auction credit requirement and holding credit requirement using the proposed method

<table>
<thead>
<tr>
<th>Bid Curve</th>
<th>Bid Price ($/MW)</th>
<th>Market Clearing Price ($/MW)</th>
<th>Payment Due to the ISO ($)</th>
<th>Holding Credit Requirement ($)</th>
<th>Pre-Auction Credit Requirement ($)</th>
<th>Additional Collateral Needed ($)</th>
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<tr>
<td>0~5</td>
<td>15</td>
<td>15</td>
<td>75</td>
<td>0</td>
<td>385</td>
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<tr>
<td>5~20</td>
<td>13</td>
<td>12</td>
<td>240</td>
<td>0</td>
<td>385</td>
<td>0</td>
</tr>
<tr>
<td>20~35</td>
<td>7</td>
<td>7</td>
<td>245</td>
<td>0</td>
<td>385</td>
<td>0</td>
</tr>
<tr>
<td>35~50</td>
<td>3</td>
<td>2</td>
<td>100</td>
<td>100</td>
<td>385</td>
<td>0</td>
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</table>

- Holding credit requirement is calculated based on auction price and credit margin ($4/MW)
Example 2 – Bid for a negative-valued CRR

- Comparison of calculated credit exposure using the existing and proposed methods

<table>
<thead>
<tr>
<th>Bid Curve</th>
<th>Existing Method</th>
<th>Proposed Method</th>
</tr>
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<tbody>
<tr>
<td>Bid Segment (MW)</td>
<td>Bid Price ($/MW)</td>
<td>Credit Margin Credit Exposure ($)</td>
</tr>
<tr>
<td>0~5</td>
<td>-3</td>
<td>15</td>
</tr>
<tr>
<td>5~20</td>
<td>-7</td>
<td>140</td>
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<tr>
<td>35~50</td>
<td>-15</td>
<td>750</td>
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</tbody>
</table>

- It is assumed that credit margin = $4/MW
Example 2 – Bid for a negative-valued CRR (cont.)
Example 2 – Bid for a negative-valued CRR (cont.)

- Comparison of pre-auction credit requirement and holding credit requirement using the proposed method

<table>
<thead>
<tr>
<th>Bid Segment (MW)</th>
<th>Bid Price ($/MW)</th>
<th>Market Clearing Price ($/MW)</th>
<th>Auction Wining Value ($)</th>
<th>Holding Credit Requirement ($)</th>
<th>Pre-Auction Credit Requirement ($)</th>
<th>Additional Collateral Needed ($)</th>
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<tr>
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<td>-4</td>
<td>20</td>
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<td>200</td>
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<td>-20</td>
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<td>1200</td>
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</table>

- Holding credit requirement is calculated based on auction price and credit margin ($4/MW)
The enhancement proposal received support from majority of stakeholders.

- The majority of stakeholders that submitted written comments support the proposal

- There are some specific suggestions and requests from stakeholders
Information on settlement implication of the proposed enhancement.

- Sothern California Edison requests the CAISO provide additional information on the settlement implication of using the negatively valued auction revenues as collateral.

- The ISO will provide the requested information when it becomes available.
Netting between allocated and auctioned CRRs.

- Silicon Valley Power suggested allowing netting between allocated CRRs and auctioned CRRs in the credit holding requirement calculation.

- The ISO will continue to monitor load migration and might consider this suggestion in the future.
Netting between negative bid and credit margin in pre-auction credit requirement calculation.

\[ Pre\text{-}Auction\text{ }Credit\text{ }Requirement = \max \left[ \$500,000, \sum_{i} \max \left( \max(0, BidPrice_{i} + CreditMargin_{i}) \times MW_{i} \right) \right] \]

- EPIC requested a change to the proposed formula for pre-auction credit requirement calculation
- The ISO believes that it does not provide sufficient credit coverage for negative bids
- Example: bid -$100/MW, credit margin $50/MW pre-auction credit requirement $0, winning value $100/MW, holding credit requirement $150/MW
Questions?
Process for Liquidating the CRRs of a Defaulting CRR Holder

Lorenzo Kristov
Principal Market Architect

CRR Stakeholder Meeting
September 8, 2009
Default by a CRR Holder

- A CRR holder may be in default due to:
  1. Failure to meet increased credit requirement
  2. Failure to pay settlement invoice
- If a party’s Estimated Aggregate Liability (EAL) exceeds its Available Credit Limit (ACL) the ISO can resell its CRR portfolio to creditworthy buyers (Sec. 12.5.1(e))
  - Bilaterally through Secondary Registration System (SRS)
  - Through CRR auction (planned new functionality)
- Defaulting party’s portfolio may consist of both positive and negative valued CRRs
- Total portfolio will typically be negatively valued (liability for holder), driving increased credit requirement.
Questions to be Addressed for Selling the CRRs of a Defaulting CRR Holder

Objective of sale: Reduce the financial harm to rest of the market from party’s failure to pay settlement invoice fully.

- Failure to pay settlement invoice fully is distributed to the market based on ISO’s default loss allocation rules
- Default does not affect CRR balancing account.

Questions:

- Should the ISO resell CRRs of a defaulting CRR holder?
- How should ISO set minimum selling price for a CRR?
- Timing: At what point should the ISO sell the party’s CRRs?
How should ISO set minimum sale price for a CRR?

- Minimum sale price should equal the price at which market is indifferent to selling versus holding the CRR.
- Selling a negative valued CRR => ISO pays sale price to new buyer (funded through the default allocation mechanism), and new buyer pays the ISO the realized IFM value of the CRR.
- Holding a negative valued CRR => the invoiced IFM value of the CRR is not paid => default spread to market.
- Proposed minimum sale price to new CRR holder = expected IFM value of the CRR for the remaining term of the CRR, based on most recent auction price data.
- Possibly adjusted for a risk premium, if market would prefer a known price up front versus uncertain future loss of revenues.
Minimum Selling Price – example

- Seasonal CRR, on-peak, source at A and sink at B, sells in annual auction for $120 (positive value).
- ISO allocates auction revenue to monthly CRR balancing accounts, by number of on-peak hours in each month:
  - July $41, August $41, September $38.
- July monthly auction produces an auction price of $43, but August & September auctions have not yet occurred.
- Then expected value of A-B on-peak CRR is:
  - July $43, August $41, September $38.
- With 10% risk premium, minimum selling prices are:
  - July $38.70, August $36.90, September $34.20
Sec. 12.5.1(e) authorizes ISO to sell a party’s CRRs based on party’s failure to meet collateral call

Should ISO sell CRRs as soon as collateral deficiency is determined to be non-curable? Or …

Should ISO wait for actual financial default on settlement invoice? Or …

Should timing depend on the individual circumstances?

ISO seeks stakeholder input on:

- When to resell CRRs
- Criteria for applying different timing in different cases
ISO welcomes comments and suggestions on all aspects of this topic.
Reevaluation of CRR Holding Credit Requirements under Extra-Ordinary Circumstances

Guillermo Bautista Alderete, Ph. D.
Market Performance Analyst

CRR Stakeholder Meeting
September 8, 2009
Background

- CRR holding Credit requirements are systematically evaluated
- Under the Tariff, CAISO may request additional collateral if there are concerns to need it
- Extraordinary Circumstances may change the risk profile of CRR portfolios
- Stakeholders have favored the concept of adjusting CRR holding credit requirements under extraordinary circumstances
Extra-Ordinary Circumstances

- An exhaustive list of extra-ordinary events may not be defined a priory.

- CAISO proposed a methodology only for instances of extra-ordinary events that can be characterized as transmission outages.

- This does not preclude CAISO to request additional collateral when need it under other circumstances not captured within this approach.
Standard Evaluation of Credit Requirements

Credit requirements is calculated for each CRR

\[
CR_{i,p}^H = -\sum_{m=1}^{M_{i,p}} \sum_{d=1}^{D_{i,m,p}} \min(\Psi_{i,d,m,p}, \lambda_{i,d,m,p}) MW_{i,d,m,p}^H + \sum_{m=1}^{M_{i,p}} \sum_{d=1}^{D_{i,m,p}} CM_{i,d,m,p}^{Daily} \times MW_{i,d,m,p}^H \sqrt{\sum_{m=1}^{M_{i,p}} D_{i,m,p}^H} , \quad \forall i, p, H
\]

Credit requirement for each CRR holder is on a portfolio basis

\[
TCV_{i,p}^H = \max\left(0, \sum_{i,p} CR_{i,p}^H \right) , \quad \forall H
\]
Re-Evaluation of Credit Requirements

- The process is triggered when an event is deemed as extra-ordinary and impacts DA
- The most recent monthly auction is taken as a reference with the outage(s) modeled
- New monthly auction prices are generated \( \bar{\Psi}_{i,d,m,p} \)
- Re-evaluate CRR holding requirements using the standard formulation

\[
CR_{i,p}^H = -\sum_{m=1}^{M_{i,p}} \sum_{d=1}^{D_{i,m,p}} \min(\Psi_{i,d,m,p}, \Omega_{i,d,m,p})MW_{i,d,m,p}^H + \frac{\sum_{m=1}^{M_{i,p}} \sum_{d=1}^{D_{i,m,p}} CM_{i,d,m,p}^{Daily} \times MW_{i,d,m,p}^H}{\sqrt{\sum_{m=1}^{M_{i,p}} D_{i,m,p}^H}}
\]
Re-Evaluation of Credit Requirements

- New auction prices are only used for the time period of the extra-ordinary event

\[ \Omega_{i,d,m,p} = \begin{cases} \Psi_{i,d,m,p} & \text{if } d \in \Delta \\ \lambda_{i,d,m,p} & \text{if } d \notin \Delta \end{cases} \]

- Re-evaluation is on a portfolio basis
- Changes will be reflected into all CRR portfolios

\[ TCV^H = \max(0, \sum_{i,p} CR_{i,p}^H), \quad \forall H \]

- More than one reevaluation may be needed
- CAISO will publish a report with the details of the reevaluation due to an extra-ordinary event
Definitions

\( H = \) \( H \)-th CRR holder
\( i = \) \( i \)-th CRR in the holder’s CRR portfolio
\( p = \) Time of use
\( M_{ip} = \) Remaining months in the term of \( i \)-th CRR for TOU period \( p \)
\( D_{i,m,p} = \) Number of days that the \( i \)-th CRR has in month \( m \) and TOU period \( p \)
\( MW_{i,d,m,p} = \) Volume (MW) of the \( i \)-th CRR on day \( d \) in month \( m \) and TOU period \( p \)
\( CM_{i,d,m,p}^{\text{Daily}} = \) Daily credit margin for the \( i \)-th CRR on day \( d \) in month \( m \) and TOU period \( p \)
\( \lambda_{i,d,m,p} = \) CRR auction price of the \( i \)-th CRR on day \( d \) in month \( m \) and TOU period \( p \)
\( \Psi_{i,d,m,p} = \) Historical expected value of the \( i \)-th CRR for TOU \( p \) in month \( m \) and day \( d \)
\( \overline{\Psi}_{i,d,m,p} = \) Modified CRR auction prices applicable through the extraordinary event period
Questions?
Non-Credit Policy and Business Process Issues

Jim Price, Lead Engineering Specialist
and
Jim McClain, Senior Market Design Engineering Specialist

CRR Stakeholder Meeting
September 8, 2009

**Non-Credit Policy Issues**
- Process for adjusting CRR holdings to reflect load migration
- Method for handling trading hubs in the CRR release
- Elimination of multi-point CRRs
- Weighted least squares objective function
- Move to single allocation tier in monthly CRR release

**Non-Credit Business Process Issues**
- Sale of CRRs in the CRR auction
- Modeling approaches to reinforce CRR revenue adequacy through transmission outage consideration
- Tracking of long-term CRRs in the CRR system
**Topic:** Revise Load Migration Process

- **Issue:** Current process for transferring CRRs due to load migration between LSEs requires the ISO to handle data on retail end-use customers.
  - Not otherwise the type of data for which the ISO is responsible for handling and processing.
  - Data are confidential to entities who are not direct ISO market participants.

- **Objective:** Revise process to avoid ISO handling of confidential retail end-use customer data.
Issue Paper Identified Initial Potential Solution

- Alternative identified in Issue Paper:
  - Initial processing of end-use customer data by UDCs, followed by re-allocation by ISO.

- Stakeholder comments on Issue Paper:
  - Current process, including roles & responsibilities, resulted from significant discussions between ISO and stakeholders. Potential revisions need adequate justification & discussion.
  - UDCs should provide load migration data and not be subject to disputes associated with ISO responsibilities.
  - ISO processing of data maintains quality control & independence.
ISO Process for Straw Proposal Will Ensure Issues Are Addressed

- Changes to CRR transfers due to load migration is now at Issue Paper stage. Straw Proposal is next step.
  - Stakeholder input will be integral in the process.
- ISO will ensure consistency of business processes if roles of ISO and UDCs change.
  - Consistency includes documentation of business process.
- Solution needs to address both ISO and stakeholder concerns.
  - Include exploring alternatives between extremes of ISO receiving confidential retail data and UDCs independently processing migration data.
**Topic:** Revise Modeling and Treatment of Trading Hubs in CRR Allocation

- **Issue:** Current CRR allocation process results in holdings of many small CRRs, due to disaggregation of a nominated Trading Hub CRR into separate CRRs for each constituent PNode of the Trading Hub.

- **Objective:** Streamline allocation process by revising approach for allocating and tracking CRRs having a Trading Hub source or sink.
Issue Paper Identified Alternatives that Eliminate Disaggregation of Trading Hub CRRs. Stakeholder Comments Identified Pros & Cons.

1. Limit the MW amounts for CRR nominations using Trading Hubs in Tier 1 of the annual CRR process so that the probability of a constraint becoming binding in tier 1 is greatly decreased.
   - **Pro:** Ensures that capacity is available after Tier 1. Trading Hub nomination results in Trading Hub award.
   - **Con:** Limits nominations that LSE can request.

2. Directly reserve transmission capacity for allocation in tier 2, during the execution of Tier 1.
   - **Pro:** Trading Hub nomination results in Trading Hub award.
   - **Con:** Limits awards at all PNodes.
Stakeholder Comment Describes Additional Alternative. ISO Invites Comments.

- Description:
  1. Disaggregate Trading Hub nominations to constituent PNodes.
  2. Conduct Simultaneous Feasibility Test (SFT) to award constituent PNodes in full, and mitigate any binding constraints using counterflow CRRs.
     - Counterflow CRR not to exceed the disaggregated CRR at PNode.
  3. CRR award would consist of the initial Trading Hub nomination and counterflow CRRs from Step 2.
  4. Eligibility for subsequent tiers is reduced by Hub Nomination less the counterflow CRRs.
    - Trading Hub CRRs eligible for renewal in Priority Nomination Process. (Counterflow CRRs not renewable)
- ISO’s Straw Proposal will consider conceptual design issues.
Example for Additional Alternative

**Nomination & Current Method:**
- LSE nominates CRR of 100 MW with Trading Hub as source and Default LAP as sink. CRR source disaggregates:
  - 20 MW @ PNode P1, 50 @ P2, 15 @ P3, 10 @ P4, 5 @ P5
- Binding constraint reduces CRR from P1 to 0 MW. [Assumption is no constraint to Default LAP.]
- Current method awards total 80 MW at P2 to P5, tracks 4 CRRs, and reduces LSE’s eligibility for Tier 2 by 80 MW.

**Awards with Alternative Method:**
- Alternative method awards 100 MW CRR with Trading Hub as source and Default LAP as sink. CRR source has been re-aggregated:
  - 20 MW @ PNode P1, 50 @ P2, 15 @ P3, 10 @ P4, 5 @ P5
- LSE also receives 20 MW counterflow CRR from DLAP to P1.
- Method awards 100 MW from Trading Hub, tracks 2 CRRs, and reduces LSE’s eligibility for Tier 2 by 80 MW.
Additional Issue

- Additional comment requested methods to overcome issues such as incorrect Trading Hub weights.
  - Incorrect Trading Hub weights resulted from a calculation error, which is unlikely to reoccur and cannot be anticipated.
  - The CRR team has developed an review process whereby another CAISO group, external to the CRR team, validates the process by which the Trading Hub weights are calculated.
**Topic: Elimination of Multi-Point CRRs**

**Issue:** To implement new enhancements to the CRR system it is necessary to build in dual functionality for PTP and MPT CRRs. This adds complexity and cost to the enhancements and to the maintenance of the CRR system.

- Only .7% of 2009 CRR nominations were awarded using the MPT function and the majority of awards were for priority 1.

**Objective:** Ease the cost and implementation of the sell feature, WLS and all future functionality.
Stakeholder comments show general support but want more information and separation of monthly tier issue

- General concern about linkage between elimination of MPT and reduced tiers for monthly process. CAISO would support removing issue of reducing tiers in monthly process in order to eliminate MPT functionality

- Request was made to have more information on cost and difficulties around MPTs
  - CAISO had discussions with vendor on cost and vendor agreed that implementation would be more costly with MPT functionality but did not provide a precise quote on the difference
  - Difficulties are not insurmountable but include unintended consequences for participants, due to incorrect use of MPT, inaccurate reports generated due to incorrect use of MPT, difference between PTP and priority 1 MPT nominations
**Topic:** Implement Weighted Least Squares Objective Function

- **Issue:** Current CRR allocation software does not equitably distribute the reduction from CRR allocation requests among participants. Software now uses the most effective nominated CRR to mitigate congestion in the simultaneous feasibility test, to maximize release of CRRs.

- **Objective:** Balance equity with maximum CRR release.

- **Alternatives to be considered:**
  - Implement weighted least squares (WLS) CRR optimization algorithm to balance equity with maximum CRR release
  - Others?
Comments Generally Support Implementing WLS

- Multiple stakeholder comments support weighted least square objective function.
- Consideration of weighted least square objective function should be coordinated with single tier monthly allocation, elimination of multi-point CRR, and revision of Trading Hub CRRs.
  - Comment requests further examples of recalculating historical monthly or annual allocation tiers, to evaluate potential impact on CRR portfolios.
- ISO is coordinating development of all issues, and will present analyses as needed to illustrate impacts.
**Issue:** Current monthly CRR process has two allocation tiers plus the auction. CRR participants have asked for a decrease to the monthly process but the current calendar does not have any slack.

**Objective:** Look at reducing the amount of time required by CRR participants as well as the CAISO to perform the monthly CRR Allocation.
Comments were generally not supportive, especially if MPT elimination was implemented concurrently

- If there is not support for this proposal CAISO would suggest removing this issue.
- One alternative, to provide more time during the monthly process that would not reduce the number of tiers, would be to revisit the 30-day outage rule. CAISO does not know whether this would be acceptable to the PTOs or not.
- One suggestion was made to modify the monthly rules to allow SLAPs to be nominated in tier 1. If this would make the monthly process more efficient this could be discussed regardless of whether the tiers are changed.
**Topic: Sell Feature in Auction**

- **Issue:** CRRs cannot be sold directly into the auction. In order to liquidate a position CRR Holders must either buy counter-flows or attempt to sell in the SRS.

- **Objective:** Provide a mechanism by which CRRs acquired in the auction can be sold directly into the auction.
General support for sell feature in auction but more discussion on rules is needed

- All comments received were in general support of this issue, but desired more discussion on the rules.
  - Can allocated and auctioned CRRs be resold?
  - Collateral requirements?
  - Thorough review of the software
**Topic:** Modeling Approaches to Improve Revenue Adequacy

- **Issue:** Initial months of the new market reflected the impact that outages had on CRR revenue adequacy. Based on this initial history the CAISO would like to discuss ways to improve the modeling of scheduled outages and accounting for un-scheduled outages.

- **Objective:** The CAISO was going to discuss this issue once we had gathered one year of data but this process provides a good forum for discussing options.
Comments suggest more information is needed on causes to revenue inadequacy

- More experience is needed to assess the causes for revenue inadequacy.
- Suggestion was made to table this issue since CAISO had stated at least 12 months of historical data was needed to see any seasonal trends.
- CAISO needs to provide information to MPs as to what precisely created initial CRR revenue inadequacy.
**Topic:** Tracking of Long Term CRRs

- **Issue:** Current software provides for a single seasonal release of CRRs. When the LT SFT is run, for each season and TOU, the awarded CRRs are actually for nine years in addition to the one year annual awards, for a total of ten years but the awarded CRRs are only visible for a single year. CRR participants have requested the CAISO provide a solution to this issue. This is mainly an administrative issue that we have a solution for until such time as we can start working on the multi-period function (not to be confused with multi-point CRRs).

- **Objective:** To have all years of the LT CRR visible in the CRR system. The CRR vendor is working on a replication feature that can be used to create the additional years of CRRs. This function should be available later this year.
This is solely an administrative process for the tracking of Long Term CRRs

- When Long Term CRRs are awarded through the allocation there is a single SFT run to award CRRs that will take a portion of the PNP seasonally awarded CRRs and extend them for nine more years to create a 10 year CRR.

- With the current CRR system the extension is very manual and can only extend one season and TOU at a time using a software feature that was not intended to do mass updates.

- As part of an upgrade the vendor has started working on an enhancement that will allow the replication of the long term market and eliminate the manual process. This will also provide for the more complete recognition of the load migration process.