



California ISO

California Independent
System Operator

California ISO

October 1, 2002 Market Design Elements

California ISO
Board of Governors Meeting
April 25, 2002

Presented by

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Board Action on April 9, 2002

1. Approved ISO Management's recommendation to seek an extension of June 19, 2001 West-wide Mitigation Measures.
2. Approved "in concept" with some modification the October 1, 2002 Design Elements.
 - Modifications
 - Eliminated Transitional ACAP
 - Changed penalty for negative Uninstructed Deviations from 25% to 50% of BEEP interval Ex-post price.
3. Instructed ISO Management and ISO MSC to
 - Provide additional justification for the proposed Damage Control Bid Cap
 - Reexamine whether imports should be subject to AMP
 - Reexamine whether AMP Bid Reference Levels should be bid-based or cost-based.
 - Provide an analysis of the impact of using a fixed percentage (e.g. 10%) versus a fixed \$/MWh amount (e.g. \$5/MWh) as the trigger threshold for the 12-month Market Competitiveness Index.



Requested Board Action for April 25

- 1) Final approval of measures needed when June 19 Order expires:
 - a) **Bid Screen Mitigation (AMP)**
 - b) Damage Control Bid Cap
- 2) Final approval of measures needed regardless of whether June 19 Order expires:
 - a) Residual Unit Commitment
 - b) Single Energy Bid Curve (DA, HA, & RT Market)
 - c) Real-time Economic Dispatch (Elimination of Target Price)
 - Previously filed Amendment 42
 - d) **Modified Must-Offer (limited to non-hydro PGA resources)**
 - e) 12-Month Market Competitive Index and Pre-authorized Additional Mitigation Provisions.
 - f) Other measures
 - Uninstructed Deviation Penalties (Previously filed Amendment 42)
 - Negative Damage Control Bid Cap
 - Recovery of Generator Emission Costs
 - **Local market power bid mitigation (Previously filed Amendment 42)**



Presentation Outline

- Review major modifications to 10/1 Market Design Elements
 - Damage Control Bid Cap (DCBC)
 - Negative Damage Control Bid Cap
 - Bid Screens and Automatic Mitigation Procedures (AMP)
 - 12-Month Market Competitiveness Index
 - Local Market Power Mitigation
- Review of other 10/1 Market Design Elements
 - Real-time Economic Dispatch (Elimination of Target Price)
 - Uninstructed Deviation Penalties
 - Residual Unit Commitment Process
 - Single Energy Bid Curve (DA, HA, RT)
 - Modified Must-Offer
 - Recovery of Generator Emission Costs
- Request final approval of October 1 Design Elements



Damage Control Bid Cap (DCBC) & Automatic Mitigation Procedures (AMP) are Complementary Mitigation Measures

• DCBC

- Limits the magnitude of price spikes
- Sets a limit on the maximum bid price the ISO will accept in its markets (energy & ancillary services).
- Will start at a low level and increase over time as market conditions improve.



• AMP

- Limits the frequency of price spikes.
- Compares bids with Reference Levels
- If bids
 - deviate significantly from Reference Level (**Screen 1**) and
 - have significant impact on the market clearing price (**Screen 2**),
- then bids will be mitigated to the Reference Level



Damage Control Bid Cap (DCBC)

Original Recommendation

$$\text{Max}(\$250, 3 * \$ (20 * (\text{Gas}) + 6))$$

Revised Recommendation

$$\text{Max}(\$250, 2 * \$ (20 * (\text{Gas}) + 6))$$

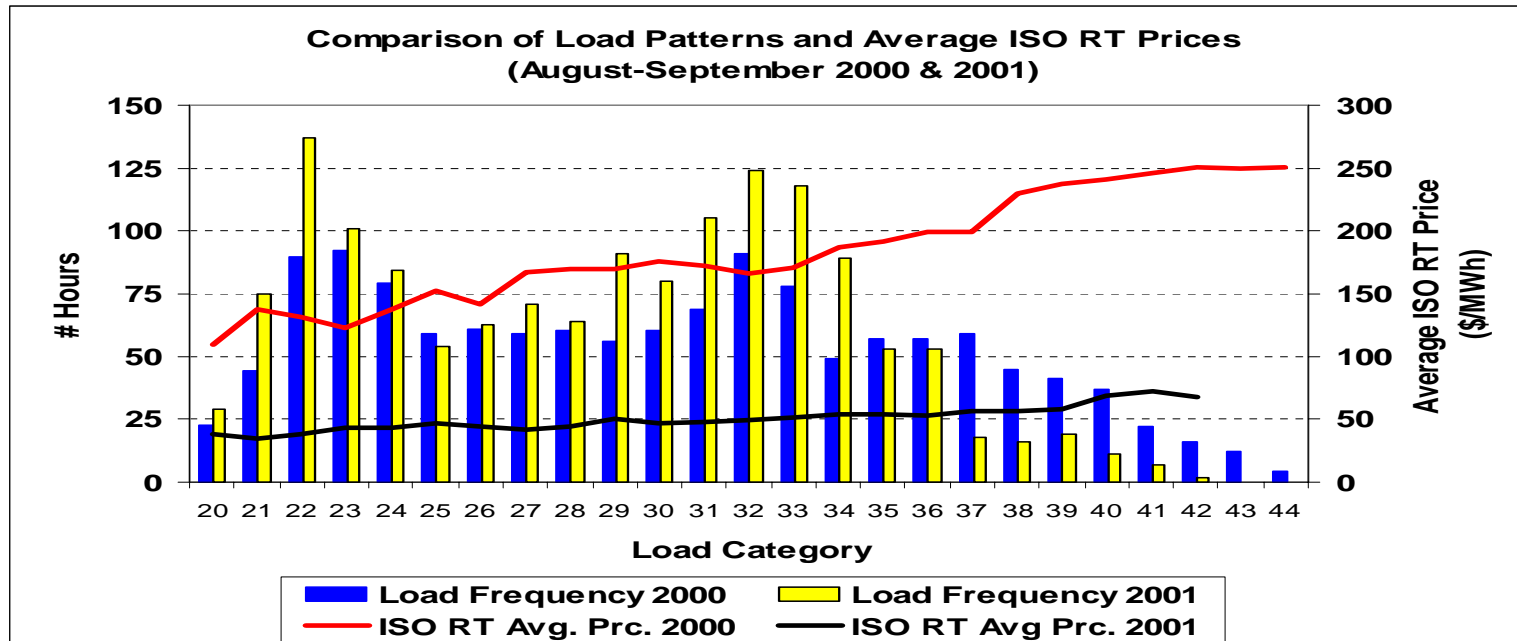


Rationale for DCBC Recommendation

- Absent a West-wide Price Limit, the ISO is concerned that a DCBC below this recommended level could result in insufficient supply bids being offered to the ISO Real-time Market during high demand periods.
- If the ISO has to make Out-of-Market (OOM) purchases above the DCBC, supply may flee the Real-time Market in order to earn above DCBC payments via OOM.
- ISO OOM transactions are problematic for the ISO
 - They undermine the market structure.
 - The ISO should not be in the role of shopping and negotiating bilateral energy transactions on behalf of LSEs.
 - They are operationally burdensome
 - They can compromise reliability if the ISO is unable to procure sufficient supply.



It is Difficult to Empirically Justify a DCBC Level



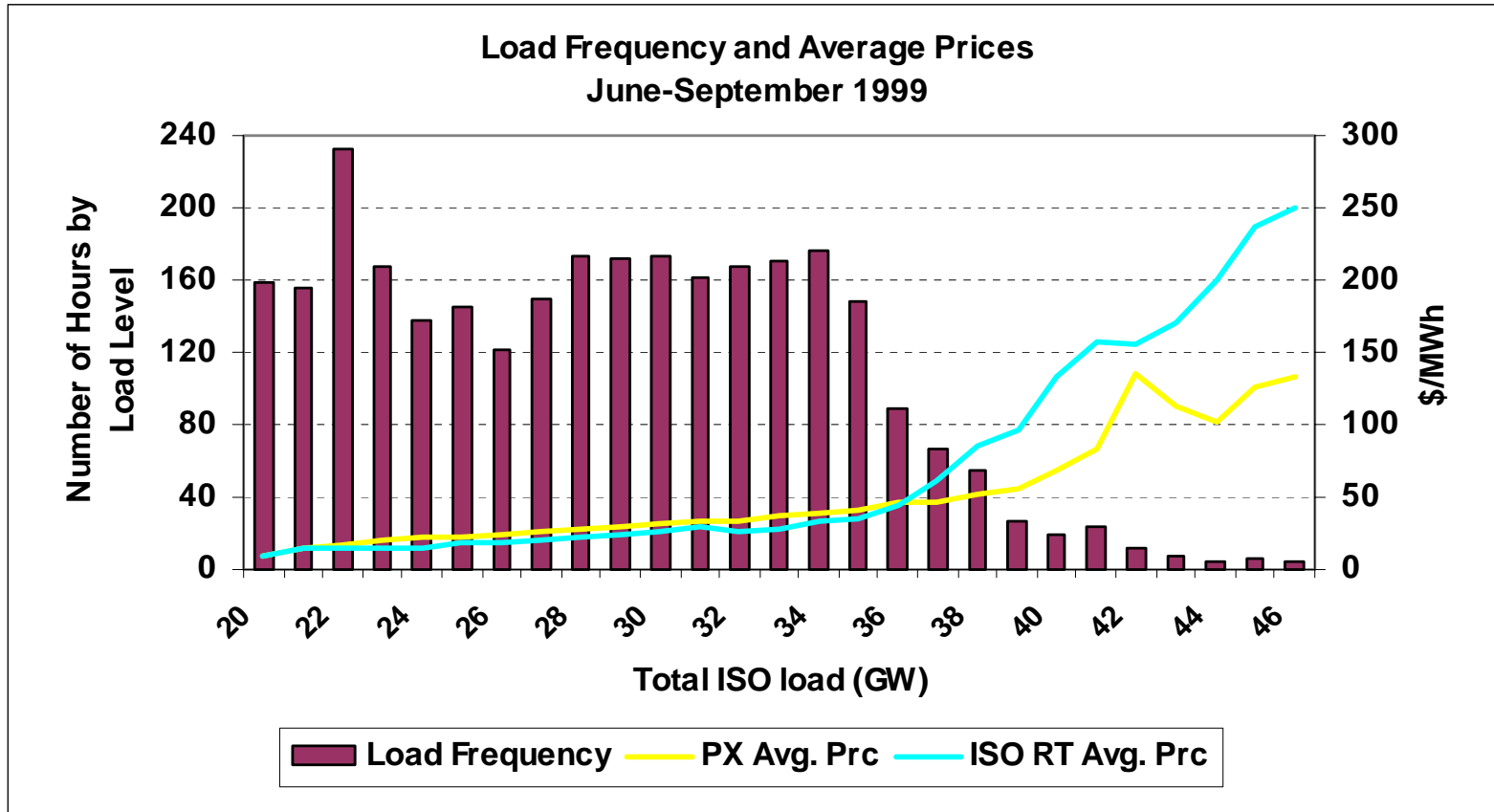
Cannot predict how constraining any DCBC will be in Summer 2003

It will depend primarily on:

- Hydro Conditions
- Summer Weather Patterns
- Conservation
- Level of Forward Contracting

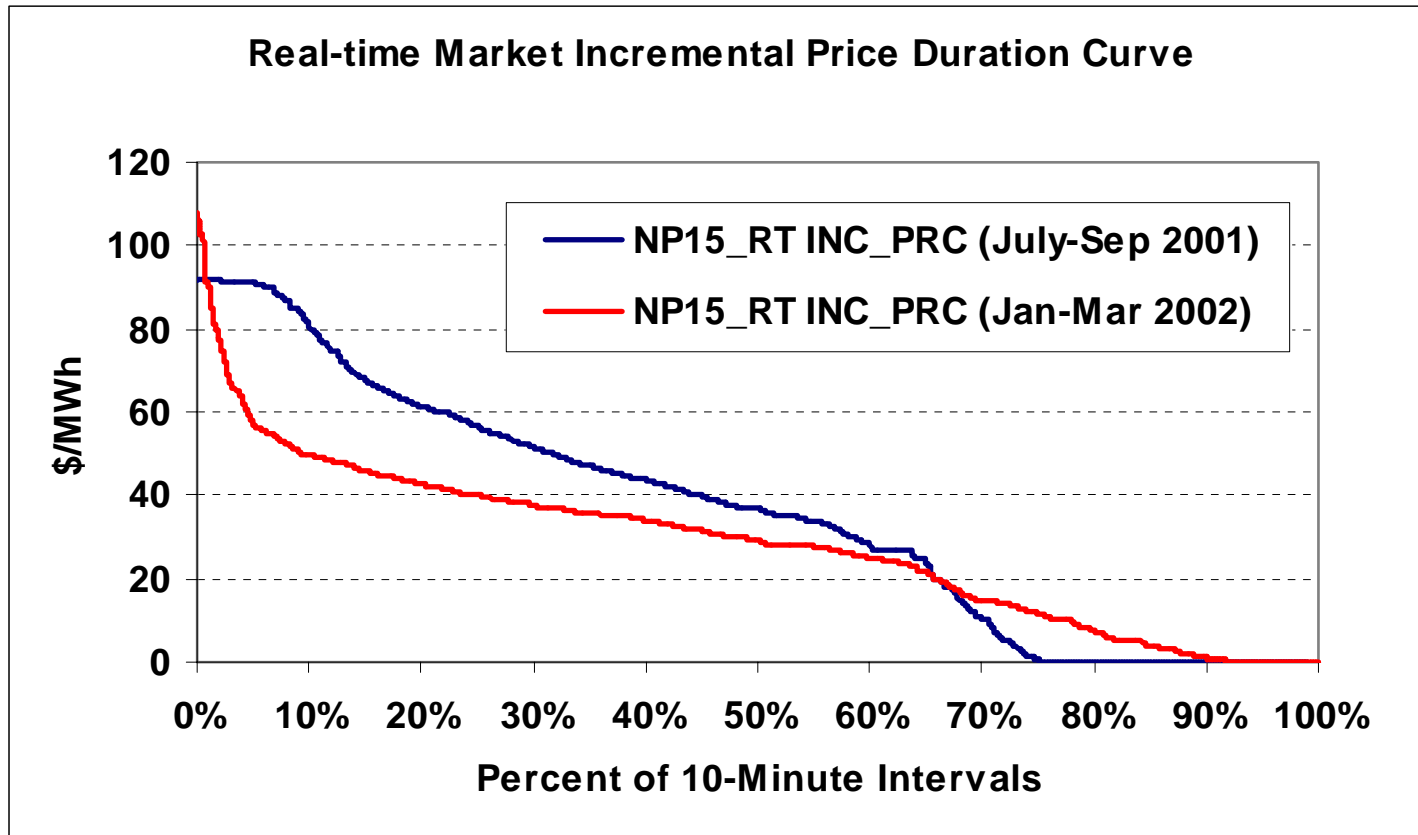


In Summer 1999, a \$250/MWh Price Cap was generally only hit under very high load conditions.



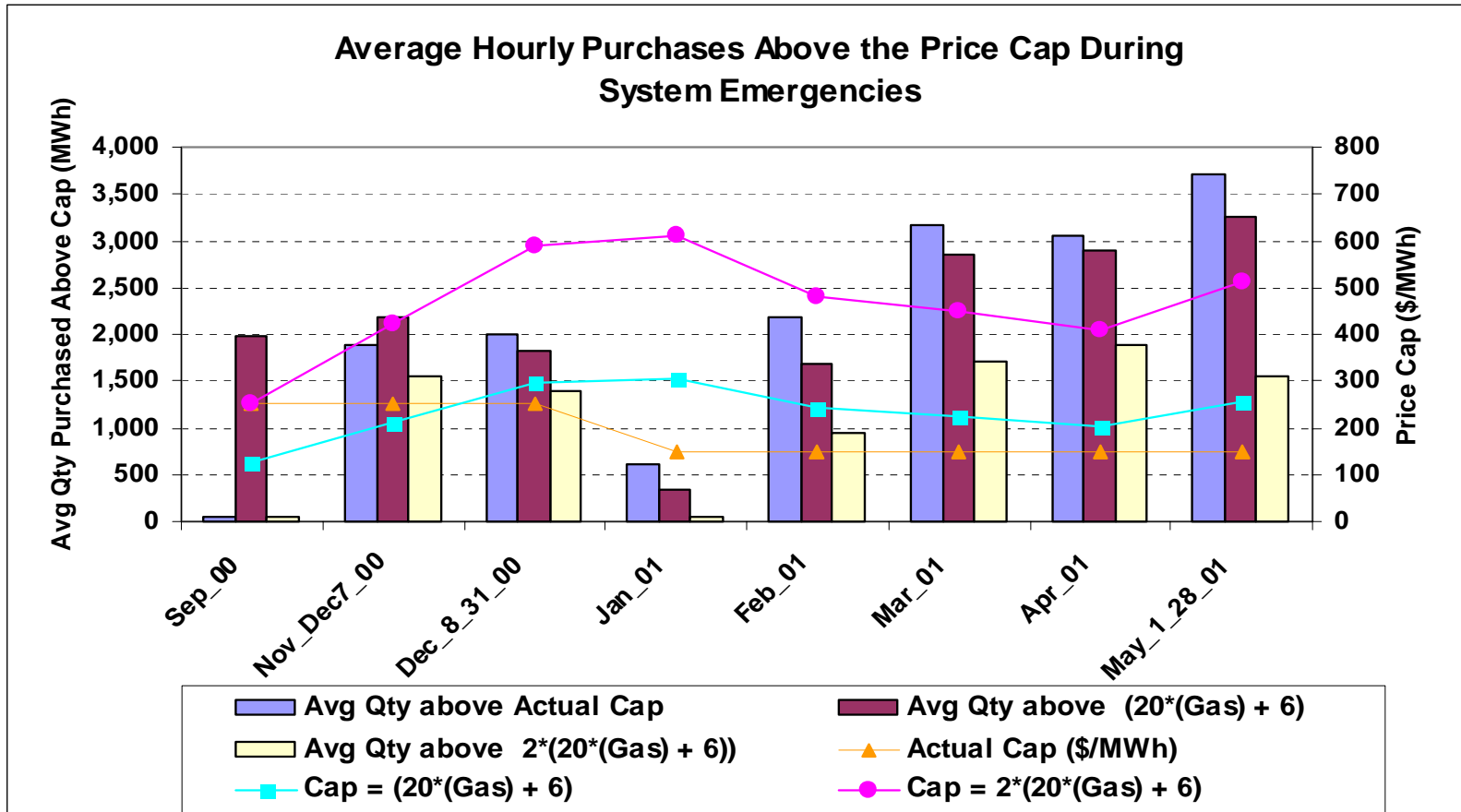


In more recent months, the ISO's Real-time price has seldom hit the cap.





The ISO proposed DCBC should reduce the potential for Out of Market transactions above the DCBC.





DCBC Summary

- Recommendation: $\text{Max}(\$250, 2 * \$ (20 * (\text{Gas}) + 6))$
- Rationale:
 - Absent a West-wide Price Limit, a DCBC below this recommended level could result in insufficient supply bids being offered to the ISO Real-time Market during high demand periods.
 - If the ISO has to make Out-of-Market (OOM) purchases above the DCBC, supply may flee the Real-time Market in order to earn above DCBC payments via OOM.
 - ISO OOM transactions are problematic for the ISO
 - They undermine the market structure.
 - The ISO should not be in the role of shopping and negotiating bilateral energy transactions on behalf of LSEs.
 - They are operationally burdensome
 - They can compromise reliability if the ISO is unable to procure sufficient supply.
 - The ISO remains concerned about the repercussions a DCBC lower than the ISO recommendation would have on:
 - Forward contracting
 - Demand Response
 - New generation investment



Negative Damage Control Bid Cap

- Recommendation: $-\$30/\text{MWh}$
- Not applicable for intra-zonal congestion –
 - Local Market Power Bid Mitigation will address the DEC game.
- Pertains to “in-merit” zonal dispatches in the ISO RT Market.
 - Over-generation conditions
 - Decremental bids used in real-time to manage inter-zonal congestion
- A negative Real-time MCP should be rare and very self-correcting.
- Potential justifications for a negative bid:
 - Gas imbalance charges
 - Bilateral contract penalties
 - External Control Area transmission costs
 - Subsidy for load resources to consume additional energy
- The ISO does not believe it is reasonable to expect that such factors could justify a negative energy bid below $-\$30/\text{MWh}$.



Bid Screens and Automatic Mitigation Procedures (AMP)

Original Recommendation

- *AMP Reference Level*
 - Cost-based bids for gas-fired
 - Historical accepted bids for all other resources
- *AMP Applicability*
 - All PGA & PLA Resources
 - All other resources eligible to set the Real-time MCP
 - Import bids **excluded**
- ***AMP applied all hours.***

Revised Recommendation

- *AMP Reference Level*
 - Historical accepted bids for all Resources
 - DMA will closely monitor bid patterns of AMP resources
- *AMP Applicability*
 - All PGA & PLA Resources
 - All other resources eligible to set the Real-time MCP
 - Import bids **included**
- ***AMP not applied in hours when ISO DA Load Forecast > 40,000 MW***



Bid Screens and Automatic Mitigation Procedures (AMP) cont.

Original Recommendation

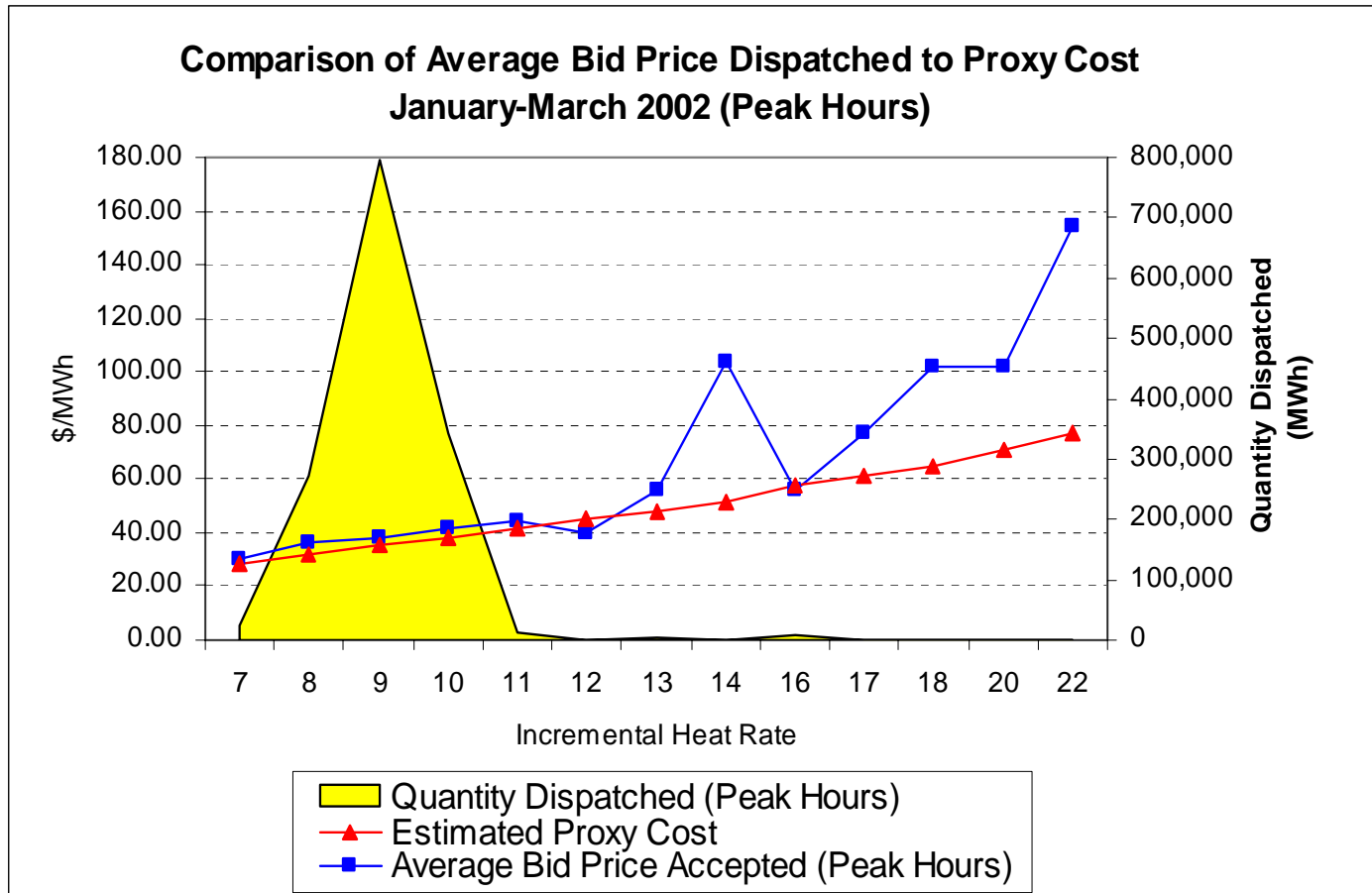
- *AMP Bid Threshold*
 - 200% increase from Reference Level
- *AMP Price Impact Threshold*
 - Min(200%, \$50/MWh) increase in Real-time MCP.

Revised Recommendation

- *AMP Reference Level*
 - Min(100%, \$50/MWh) increase from Reference Level.
- *AMP Price Impact Threshold*
 - Min(100%, \$50/MWh) increase in Real-time MCP.



Bid Screens and Automatic Mitigation Procedures (AMP) cont.





12-Month Market Competitiveness Index (MCI)

Original Recommendation

- **12-Month Trigger Threshold for Additional Mitigation**
 - **10%** above 12 - Month Competitive Baseline Average Costs

Revised Recommendation

- **12-Month Trigger Threshold for Additional Mitigation**
 - **\$5/MWh** above 12 - Month Competitive Baseline Average Costs

Rationale for Change:

- Similar to a performance based rate design. Will provide better incentives for generator cost reduction.

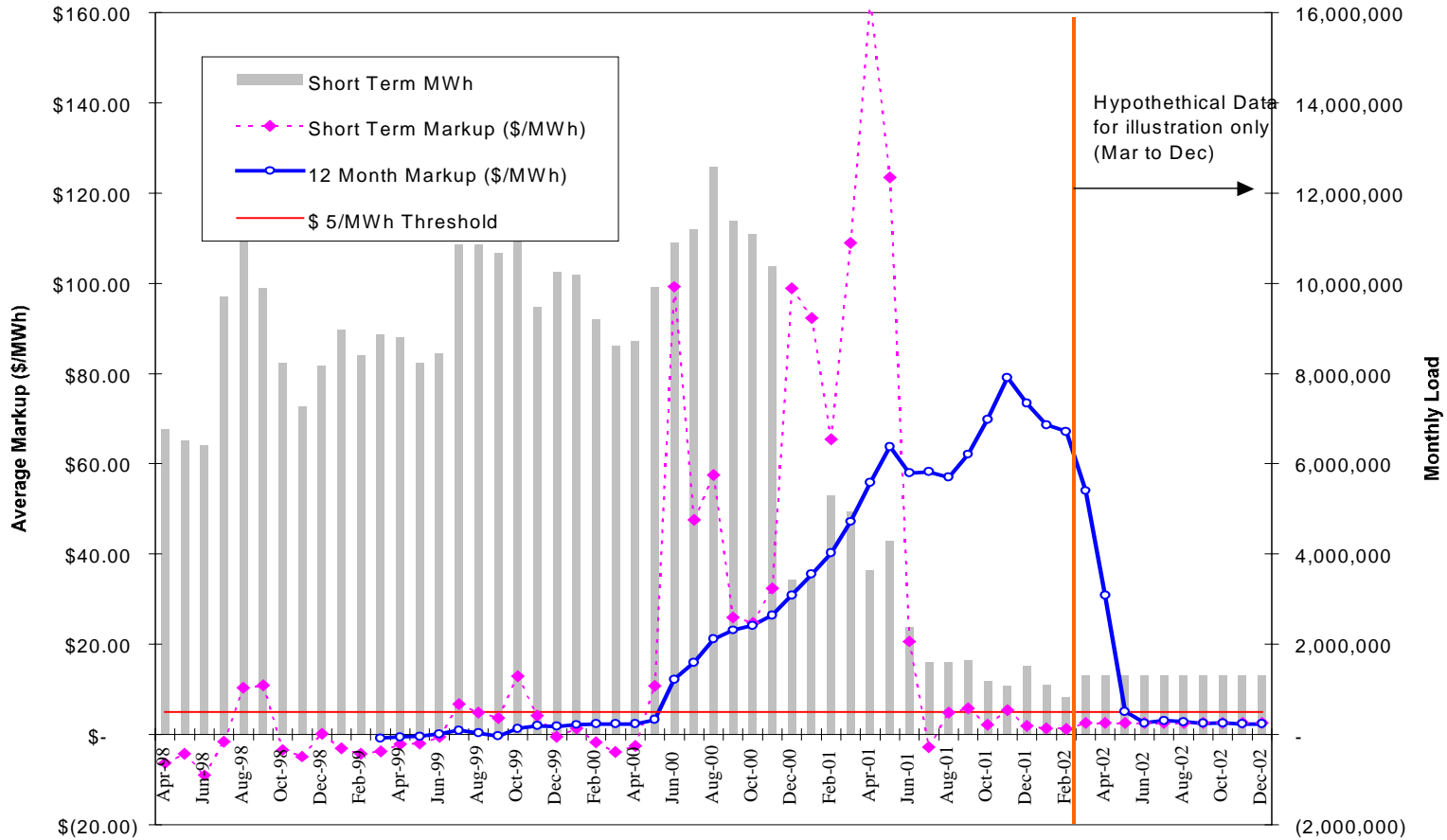


12-Month MCI: Potential Cost to Load Impact of a \$5/MWh Threshold

- Estimated cost exposure is approximately \$150 Million/Year.
 - a. Estimated Annual Net-Short = 55,123 GWh
 - b. Total covered by long-term contracts and quarterly purchases = 25,056 GWh.
 - c. Difference (a-b) = 30,067 GWh
 - d. Estimated Cost = \$150 Million/Year



12-Month Market Competitive Index





Local Market Power Mitigation

- Local market power mitigation is a necessary permanent market design element.
- ISO proposed a local market power mitigation approach in Amendment 42:
 - Impose scheduling limits on resources within locally congested areas (interim forward intra-zonal congestion management)
 - Mitigate real-time energy bids when resources in local constrained areas are dispatched to relieve the localized transmission constraint.
- Alternative interim approaches to forward intra-zonal congestion will be discussed at the FERC Stakeholder Conference (May 9-10)
- Recommendation
 - Include local market power real-time market bid mitigation in the May 1 Filing and ask for Summer 2002 implementation.
 - Defer filing an interim forward intra-zonal congestion management approach until after the FERC Stakeholder Conference (May 9-10).



Real-time Economic Dispatch (Elimination of Target Price)

- Previously approved by the Board and filed in Amendment 42.
- On March 27, 2002, FERC rejected this element because it believed it should be part of a comprehensive market design proposal.
- Critical long-term enhancement of real time market
- The ISO currently uses a Target Price as a mechanism to eliminate price overlaps in its Real-time market. This approach is problematic in that it creates separate INC and DEC prices in each 10-minute interval.
- Real-time Economic Dispatch would provide a more sophisticated approach to clearing the price overlap and would eliminate separate INC and DEC prices.



Uninstructed Deviation (UID) Penalties

- In Amendment 42, the ISO filed to penalize generators that fail to follow dispatch instructions (uninstructed deviations).
- The proposal exempts deviations that are within a reasonable range of the instructed level but penalizes excessive uninstructed deviations.
 - Generator owners that engage in excessive negative UID (i.e. under-generation) are charge the real-time MCP plus 50%.
 - Generator owners that engage in excessive positive UID (i.e. over-generation) are paid the real-time MCP less 100% (i.e. no payment).
- Market Power Mitigation Benefit
 - Should improve generation performance and reduce real-time market volatility.
 - Should reduce physical withholding associated with generation units failing to respond to dispatch instructions.



Residual Unit Commitment (RUC) Process

- Day-ahead process that enables the ISO to commit additional generation resources and procure energy imports to meet forecasted loads.
- The ISO will, in the Day-Ahead RUC process
 - Commit 100% of the capacity necessary to serve the next day's ISO forecasted load; and
 - Procure up to 95% of the forecasted energy requirements (minimum load energy and imports)
- Once the ISO implements a Day-ahead Energy Market, only imports identified as ACAP resources will be considered in the RUC process.
- Unloaded capacity that is selected in RUC will receive a capacity payment for each MW of capacity that was committed but not dispatched.
 - Payment withdrawn for each MW that is scheduled as an export in HA or RT.
 - Payment derived from cost-based proxy bid curve



Single Energy Bid Curve (DA, HA, & RT Market)

- Requirement for bidders to submit a single energy curve for all services in each temporal market (i.e. DA, HA, RT).
 - DA Market
 - Single energy bid curve
 - Can submit different capacity bids (Reg, Spin, Non-Spin, Repl.)
 - HA Market
 - Can submit new single energy bid curve for capacity not committed in DA (e.g. capacity not committed in DA Ancillary Service, RUC).
 - Can submit different capacity bids (Reg, Spin, Non-Spin, Repl.)
 - RT Market
 - Can submit supplemental energy bid for non-committed capacity.



Other 10/1 Elements

- Must-Offer Requirement for PGA resources
 - Hydro resources would continue to be exempted
 - Uncommitted long-start units must be offered to the ISO's Residual Unit Commitment Process
 - On-line units or quick start units must offer all available capacity to the ISO's real-time market.
- Recovery of Emissions Costs
 - Emission Costs are to be excluded from bids submitted to the ISO market and billed to the ISO as a separate uplift as is the case today under the FERC June 19 Order.



Board Motions