Briefing on commitment costs and default energy bid enhancements

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CAISO proposes market-based commitment costs subject to dynamic local market power mitigation

- CAISO is the only ISO that does not support market based commitment costs bids subject to mitigation

- Propose mitigation of commitment costs using three-pivotal supplier test
  - Allow suppliers to submit market-based commitment cost bids
  - Apply dynamic market power mitigation test to market-based commitment cost bids

ISO seeking discussion with Market Surveillance Committee on following issues

- Issue 1 – what is a robust approach to testing non-binding constraints?

- Issue 2 – Should LMPM tests be performed and applied separately for energy and commitment cost components?

Issue 1 – what is a robust approach to testing non-binding constraints?

Points of general consensus

- LMPM needs to test for potential local market power due to binding non-competitive constraints for energy mitigation and commitment cost mitigation

- LMPM needs to test for potential local market power of resources needed to resolve a constraint that would be non-binding in final dispatch

Points needing further discussion

- Which non-binding constraints to test?
- Should test capture loop flow effects from multiple non-competitive constraints more robust than constraint-by-constraint?
- Is potential to impact price relevant to identifying local market power for mitigating commitments?

Policy explanation for non-competitive congestion component approach for energy component mitigation

- Tests for incentive to exercise market power
  - Based on resources' effectiveness to relieve congestion
  - Captures loop flow effects by calculating net effectiveness of resource across non-competitive constraints (system impact)

- Tests for ability to impact price
  - Only tests binding constraints
  - Based on sensitivity of the objective function to relaxing the non-competitive constraint (i.e. shadow price)

Applying three pivotal supplier test to entire supply offer – current approach in Eastern Market does not account for loop flow effects or ability to impact price

- Existing approach for mitigating three-part-bids test for ***incentive to withhold capacity***:
  - Tests each constraint for whether there is sufficient supply without potentially pivotal suppliers to identify non-competitive constraints
  - Mitigates if resource is effective based on shift factor to relieve congestion on any non-competitive constraint
  - Mitigates market based supply offer to cost based supply offer (all three-parts)

- Can set mitigation test to establish surrogate thermal constraints and selectively relax minimum load constraint

Applying three pivotal supplier test to entire supply offer – proposed principles

- Allowing for the net effect rather than constraint-by-constraint approach for testing for incentive to exercise market power is appropriate for commitment costs

- It is not appropriate to use shadow price contribution to test for ability to impact price for identifying commitments needing mitigation
  - Commitment costs do not directly impact price
  - Contribution to the marginal cost of congestion at resource's location is irrelevant for mitigating commitment costs

ISO seeking discussion and MSC input on approach to applying mitigation

- Which non-binding constraints to test?
- Should test capture loop flow effects from multiple non-competitive constraints more robust than constraint-by-constraint?
- Is potential to impact price relevant to identifying local market power for mitigating commitments?

Issue 2 – Should LMPM tests be performed and applied separately for energy and commitment cost components?

Evaluating applying mitigation to energy and commitment cost components

- ISO has maintained its policy that supply offers are for the total production cost of resource
  - Market minimizes, subject to security constraints, the least cost total production cost solution
  - Market does not have separate markets for energy and commitments

- Based on this principle, ISO initially proposed that when energy test on binding constraint fails to mitigate entire offer

Evaluating applying mitigation to energy and commitment cost components cont.

- Select stakeholders commented that energy and commitment cost offers should be evaluated separately

- Rationale for treating as separate tests:
  - Commitment & dispatch decisions occur at different times
  - Energy mitigation largely tests for potential price impact and largely does not include minimum load energy in residual supply index calculations
  - Commitment cost mitigation largely tests for potential uplift impact and will include minimum load energy in residual supply index calculations

ISO seeking discussion and MSC input on approach to applying mitigation

- If energy mitigation criterion is met ➔

  Should mitigate only energy component or entire supply offer?

- If commitment cost mitigation criterion is met ➔

  Should mitigate only commitment cost components or entire supply offer?

END

Appendix - Proposal

Propose differences in commitment cost mitigation

Mitigation Design Feature	IFM	STUC	HASP	RTM Pre-Dispatch/FMM
Requires new LMPM process (all constraints run and post-processing)	N	**Y**	N	N
Identifying potentially pivotal suppliers	Includes net buyers and sellers			
Type of constraint tested	Change to binding plus additional constraints identified by CAISO as likely needing commitments to resolve a constraint			
RSI calculation – allows commitment/de-commitments	Y, impacts WC and SPCF ^{PPS}			
RSI calculation – basis for maximum capacity that could be withheld from pivotal suppliers	Max effective available capacity	Max effective available capacity (ramp constrained)		
RSI calculation – demand for counterflow should include available counterflow not dispatched up to unloaded capacity	Only for non-binding constraints include in the denominator of the RSI calculation the lower of effective capacity not dispatched in AC run or unloaded capacity (Limit-AC flow)			
Mitigation Criterion	Net effect of commitment on congestion system-wide (replace with default shadow price if not binding)			

Proposal to identify set of testable constraints

- Proposal revised to test:
  - All binding constraints
  - Constraints likely needed commitments to resolve the constraint will largely be structural in nature
- Propose ISO needs flexibility to identify the additional constraints since area of concerns may change based on system dynamics

Proposal to identify set of testable constraints cont.

- Publish seasonal static competitive path assessments
- Constraints identified in “non-competitive” set based on static structural test
- If ISO identifies system dynamics changed significantly after the static assessment the ISO will re-run static assessment
- DCPA for commitment cost will be performed on all binding constraints and any “non-competitive” constraints from static assessment

For example - https://www.caiso.com/Documents/CompetitivePathAssessment-2012_Release3_Q4Final.pdf

Proposal to add second RSI calculation

- Determine two separate RSI for two separate sets of constraints
- Determine potentially pivotal supplier (PPS) test differently
- Change treatment to include impact of minimum operating level to capture ability to shutdown or be de-committed
- Change treatment to allow for inclusion of minimum load energy if resource can be started within unit commitment horizon (currently written in tariff at 60 min or less)

Proposal to add second RSI calculation and altering approach for select formulas relative to those used in energy mitigation test

- Second residual supply index (RSI) calculation (no changes to formula only inputs and applied to L)
- Inputs to RSI calculation that differ from energy test:
  - Withheld Capacity (WC) at affiliate portfolio level (J) logic needs revisions for real-time processes
  - Supply of Counter Flow (SCF) from potentially pivotal suppliers logic needs revisions for real-time processes
- Feasible start-up if able to within commitment horizon
- New mitigation criterion – net effect of commitments

Proposal to calculate withheld capacity in real-time

CAISO revised proposal to calculate $WC_{l,j}^{CCM}$ in RTUC:

$$WC_{l,j}^{CCM} = \sum_{i=1}^{n} \left[SF_{l,i} * \left(\min\left(DOP_{i,t-1} + RR_i * 15, ENGYMAX_i \right) \right) \right.$$

Proposal to calculate supply of counterflow for potentially pivotal suppliers in real-time

CAISO revised proposal to calculate $SPCF_{l,j,i}^{PPSCCM}$ in RTUC:

$$SPCF_{l,j,i}^{PPSCCM} = SF_{l,i} * \delta \max(DOP_{i,t-1} - RR_i * 15, ENGYMIN_i)$$

$$Where\ \delta = \{0,1\}$$

$$DOP_{i,t-1} - RR_i * 15 \leq ENGYMIN_i \rightarrow \delta = 0$$

$$DOP_{i,t-1} - RR_i * 15 > ENGYMIN_i \rightarrow \delta = 1$$

δ is locked to 1 for:

- Must-run resources (i.e. self-schedules or AS awards),
- Resources that have not fulfilled minimum run time (i.e. min up time)

Proposal to apply mitigation tests separately to energy versus commitment cost components

- If energy mitigation criterion at resource is met ➔ mitigate energy component if energy criterion fails
- If commitment cost mitigation criterion at resources is met ➔ mitigate commitment cost components to commitment cost reference level

Proposal to apply commitment cost mitigation design to corrective capacity constraints

- Mitigation test would be applied to corrective capacity constraints by integrating the two proposed policy changes
  - CME changes to LMPM to account for a 20 minute corrective capacity product
  - CCDEBE changes to account for potential market power concerns with commitments
- CME corrective capacity constraints will eliminate the majority of the need to enforce minimum online constraints

Proposal to apply mitigation to resources within a minimum online constraint for reactive power or voltage needs

- Mitigate to cost based offers resources within minimum online constraints for local issues
  - Typically enforced for reactive power or voltage requirements
- Considered “uncompetitive” by definition because they are for reactive power or voltage requirements that are:
  - Local issues by nature
  - Would likely include very few resources under the constraint