Changes to Bidding and Mitigation of Commitment Costs

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Stakeholder Conference Call
March 24, 2010
Agenda

- Background
- Overview
- Start-Up and Minimum Load (SU and ML)
- Modification of Proxy Cost Option
- Multi-Stage Generation (MSG) Transition Costs
ISO Stakeholder Process Overview

1. Project is triggered
2. Issue ID Paper
3. Straw Proposal
4. Draft Final Proposal
5. Board of Governors
6. FERC

We are here

Opportunities for Stakeholder Input
Background

- At the start of the new market in April 2009
  - Excessive cycling of units
  - Commitment to Pmin and then shutdown
- Changes considered to SU and ML
  - Daily bidding?
  - More frequent election to proxy/registered?
  - Account for opportunity costs?
- Since then…
  - Improvements to software and processes
  - Fewer generation and transmission outages
  - SU/ML changes set aside
Overview

- Changes to Start-Up and Minimum Load
  - Independent election to proxy or registered
  - Daily bidding of proxy SU and/or ML IF bid price below proxy

- Changes to the proxy cost option
  - Registered O&M option
  - Gas delivery points granularity
  - Opportunity costs for use-limited resources

- Rules for MSG Transition Costs
  - Two rules that bound costs within the MSG transition matrix
Election of Proxy or Registered SU and ML costs

- Independent election of SU and ML costs
  - A registered cost can be submitted for start-up which can account for non-fuel costs such as maintenance
  - Proxy cost can be elected for minimum load costs as these costs are highly dependent on fuel costs
Daily bids for SU/ML

- Resources that have elected the proxy cost option for SU and/or ML
- Can bid in on a daily basis
- As long as those bid values are below the proxy cost value
Modification of the Proxy Cost option

- Bidding of O&M costs (SU)
  - Annual basis

- Refinement to Gas Prices (SU and ML)
  - Two additional delivery points

- Opportunity Costs for use-limited resources (SU)
  - Based on forecasted prices and use-limitation plan
Bidding O&M Costs

- Current ISO defaults would be the “default option”
  - Gas Turbine – $4/MWh
  - Combined Cycle – $2/MWh
  - Negotiated – $6/MWh

- PJM Approach would be the “submitted option”
  - FERC Accounts prescribe costs
  - Annual election/update

- PJM Results
  - Combined Cycle: $2.80 in 2008, and $3.07 in 2009
Refinement to Gas Prices

Malin

PG&E CityGate

SoCal CityGate

SoCal Border

NP15

SP15
Comparison of gas delivery point prices

- On average, the price at Malin is 31¢ per MMBtu (5%) less than the price at PG&E CityGate.
- The correlation coefficient between PG&E CityGate and Malin is 0.87.

- On average, the price at SoCal Border is 1¢ per MMBtu (0.01%) less than the price at SoCal CityGate.
- The correlation coefficient between SoCal Border and SoCal CityGate is 0.99.
Gas transport costs

- Gas transport costs
  - Highly locational – essentially resource-specific
  - Prescribed by multiple FERC tariffs

- Current gas transport component of proxy SU/ML
  - Based on PG&E, SCE and SDG&E rates
  - Includes a 10% adder to account for other additional costs

- The ISO proposes not to change this
  - The 10% adder in addition to more granular gas delivery point prices should improve participants’ ability to recoup gas transport costs
Opportunity Costs for Use-Limited Resources

- Methodology for valuing run-hours for use-limited resources
  - Forecasted prices
    - Historical energy and gas prices used to derive an implicit heat rate
    - Heat rate applied to forward energy and gas prices
  - As run-hours get scarcer, value increases

- Adapting the methodology for start-ups of use-limited resources
  - Monthly updates to annual use-limitation plans
  - Weekly break-outs?

- If a resource is dispatched up off of its Pmin, don’t count opportunity costs for BCR?
Example of Opportunity Cost valuation

- Maximum of 120 run-hours, maximum MWh is 15,000 and estimates 10 starts for the month
- 10 starts is estimated to be 12 hours at 125MWh
- Take the 120 highest forecasted prices for the month and rank them by frequency
- The first start is the value of the sum of the 12 most frequent prices \((p_1*125 + p_2*125 + \ldots + p_{12}*125)\)
- The tenth start is the value of the sum of the 12 least frequent prices \((p_{109}*125 + p_{110}*125 + \ldots + p_{120}*125)\)
- Can submit a value \(\leq\) calculated value
Multi-Stage Generating Resource Background

- MSG Resources
  - Units with multiple configurations
  - Only one configuration operates at a time

- Transition Matrix
  - Maps costs and operating parameters associated with transitioning between configurations
  - Transition costs are static in the Master File for 30 days
### MSG Transition Matrix

<table>
<thead>
<tr>
<th>“From” Configuration</th>
<th>“To” Configuration</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
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MSG Transition Costs

- Design principles
  - Prevent economic withholding
  - Provide flexibility
  - Avoid rigid rules
    - Difficult to prescribe parameters
    - Onerous to validate data

- How TC are different from SU costs
  - Unidirectional
  - Widely varied sources of costs
  - Explicit downward transition costs
MSG Transition Cost Rules

- **maxSU**: $ value of going from offline to the highest or most expensive configuration – Negotiated

- **Rule 1**: The sum of costs from offline to the pmax of the maxSU configuration back to offline must be between 50% and 150% of maxSU

- **Rule 2**: For any feasible transition from i→j, feasible transitions that nest within it must be between 50% and 150% of the cost of the transition from i→j
MSG Transition Cost Rule Examples

- **Rule 1**: The sum of costs from offline to the pmax of the maxSU configuration back to offline must be between 50% and 150% of maxSU

- **Example**:
  - maxSU = $18,000 (associated with configuration 4)
  - SU = $10,000
  - Transition 1→2 has TC = $5,000
  - Transition 2→4 has TC = $7,000
  - Transition 4→3 has TC = $1,000
  - Transition 3→1 has TC = $1,500
  - SU + TC(1→2) + TC(2→4) + TC(4→3) + TC(3→1) = $24,500
  - 150% of maxSU = $27,000 > $24,500 so it PASSES Rule 1
MSG Transition Cost Rule Examples

- **Rule 2:** For any feasible transition from \( i \rightarrow j \), feasible transitions that nest within it must be between 50% and 150% of the cost of the transition from \( i \rightarrow j \)

- **Example:**
  - Transition \( 1 \rightarrow 4 \) has TC = $8,000
  - Transition \( 1 \rightarrow 2 \) has TC = $6,000
  - Transition \( 2 \rightarrow 4 \) has TC = $7,000
  - Look at TC(1→2) + TC(2→4) to make sure it is between 50% and 150% of TC(1→4)
  - $6,000 + $7,000 > 150% of $8,000
  - These transition costs FAIL Rule 2
## Commitment Costs Stakeholder Process

<table>
<thead>
<tr>
<th>DATE</th>
<th>EVENT</th>
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<tbody>
<tr>
<td>March 16</td>
<td>Straw Proposal posted</td>
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<tr>
<td>March 19</td>
<td>Market Surveillance Committee Meeting</td>
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<td>March 24</td>
<td>Conference call</td>
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<td>April 2</td>
<td>Stakeholder comments due</td>
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<td>Draft Final Proposal posted</td>
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<td>Call to answer any remaining questions</td>
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<td>Final SH comments due</td>
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<td>May 17-18</td>
<td>CAISO Board of Governors</td>
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Questions, Comments, Concerns & Compliments…

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