Convergence Bidding Working Group – 9/03/09

Teleconference Information

Dial-in Number: (800) 401-8436

International Dial-in: (612) 332-0418

There is no conference ID number.

Web Conference Information

Web Address: www.webmeeting.att.com

Meeting Number: 5114682337

Access Code: 9341896

Agenda

TIME	TOPIC	PRESENTER
9:00 – 9:05	Introduction to Working Group	Janet Morris
9:05 – 9:15	Recap on bid volume rules	Li Zhou
9:15 – 9:25	Update on bid transaction volume testing	Siemens, Khaled Abdul-Rahman
9:25 – 9:35	Plans for voltage stability testing	Khaled Abdul-Rahman
9:35 – 9:45	Resource IDs	Brian Holmes
9:45 – 10:00	Open discussion	

Introduction

- Based on feedback at the August 19 Implementation Workshop, the CAISO has established a recurring Stakeholder Working Group to discuss Technical Challenges to Convergence Bidding implementation
  - Bi-Weekly meeting Thursdays at 9am
  - Focus on implementation challenges
- Future Sessions
  - CAISO welcomes suggestions for future agenda items
  - Participants are encouraged to discuss their internal challenges and present results of their studies and analysis on future sessions

Recap on bid volume rules

- Option 1 – Apply a configurable system-wide limit to the count of CBs submitted per trade hour.
  - When the count of bids received from all SCs reach the limit, no additional bids are accepted.
- Option 2 – Apply a configurable SC-based limit to the count of CBs submitted per trade hour
  - Each SC is allocated a number of submittals equal to the system-wide limit divided by the number of SCs
  - Each SC faces and individual "last in first out" rule

Recap on bid volume rules

- Option 3 – A variation on Option 2
  - Each SC is initially allocated its pro-rata share of bids
  - Bids in excess of the SC's individual limit can be submitted but are subject to rejection based on a "last in first out" rule
  - At the close of IFM submittal process, the CAISO will check if any SCs have used less than their limit. If so, any "extra" available bids will be reallocated on a pro-rata basis
- Example – Option 3

SCID	Limit	Submitted	"Extra"	Re-Allocation	Rejected
SC1	2,500	5,000		1,750	750
SC2	2,500	6,000		1,750	1,750
SC3	2,500	1,000	1,500		
SC4	2,500	500	2,000		

Update on bid transaction volume testing

- Siemens is conducting initial Convergence Bidding stress testing
  - Initial goal is to estimate performance impacts and sizing requirements related to the volume (count) of bids submitted
  - The results of three tests will be presented today
- Terminology
  - Resource refers to a Market Resource (physical or virtual)
  - Bid refers to Energy bid made by a single Market Resource
- Scenario Characteristics
  - Derived from a CAISO Summer day
  - Virtual bids are simulated by replicating existing physical load and generation resources and modifying their bid curves (price and MW quantities)
  - Each Resource submits up to 24 price curves per day (different price / MW quantities in each hour)
  - All “virtual” bids are of the same type as the underlying physical resource

Scenario 1 – Description

Item	Scenario Description	Market Rationale	Software Rationale
1	Additional 4,500 demand bids created at LAP and Sub-LAP levels to reach approx 5,500 total bids; run IFM application	Mimic LAP-only CB scenario where MPs expectation is that RT prices are higher than DAM prices and/or SCs are hedging balanced Inter-SC Trades	Test memory consumption and execution performance of selected IFM components (e.g. database sizing, run-time memory consumption and data structures, core optimization problem size and numerical integrity)
1-a	Total virtual MW quantity is only 10% above physical bids; multiple runs with varied prices	Limited CB on a system level	Impact on power flow
1-b	MW quantity for each virtual bid is the same as MW quantity of physical resource; multiple runs with varied prices	Practically unlimited CB; impact on DA energy and A/S prices	Impact on power flow

Scenario 1 – Preliminary Results

Item	Scenario description	Test Status	Things accomplished	To Do
1	Additional 4,500 demand bids created at LAP and Sub-LAP levels to reach approx 5,500 total bids; run IFM application	Data setup complete	IFM Software was modified to be able to solve with number of Energy bids greater than sized for current MRTU production system. Memory consumption improved for selected software modules.	Test memory consumption and execution performance of selected IFM components (e.g. database sizing, run-time memory consumption and data structures, core optimization problem size and numerical integrity)
1-a	Total virtual MW quantity is only 10% above physical bids; multiple runs with varied prices	IFM executed for several runs with modified price setups. Test completed	Performance of the core optimization problem was very satisfying and within existing optimization execution times. Selected software modules exhibited slower execution due to large volume of aggregated bids and increased amount of MW award aggregation and disaggregation processing. Overall performance was 10-20% slower than current average IFM runs. Power Flow solving with AC solution.	Improve performance of selected software modules processing aggregate resources.
1-b	MW quantity for each virtual bid is the same as MW quantity of physical resource; multiple runs with varied prices	IFM network unconstrained unit commitment executed; currently addressing software issues in transferring unconstrained commitment to Power Flow	Performance of the core optimization problem was satisfying and within existing optimization execution times.	Resolve software issues in transfer of unconstrained unit commitment solution to Power Flow

Scenario 2 – Description

Item	Scenario Description	Market Rationale	Software Rationale
2	Additional 4,000 supply bids created at generation nodes to reach approx 5,000 total bids; run IFM application	Mimic scenario where MPs expectation is that RT prices are lower than DAM prices and/or supply side is over-hedging production	Test memory consumption and execution performance of selected IFM components (e.g. database sizing, run-time memory consumption and data structures, core optimization problem size and numerical integrity)
2-a	Total virtual MW quantity is only 10% above physical bids. Multiple runs with varied prices	Limited CB on a system level	Impact on power flow
2-b	MW quantity for each virtual bid is the same as MW quantity of physical resource; multiple runs with varied prices	Practically unlimited CB; impact on DA energy and A/S prices	Impact on power flow

Scenario 2 – Preliminary Results

Item	Scenario description	Test Status	Things accomplished	To Do
2	Additional 4,000 supply bids created at generation nodes to reach approx 5,000 total bids; run IFM application	Similar scenario was tested earlier, so this batch of tests is left as the last.	Pending	Test memory consumption and execution performance of selected IFM components (e.g. database sizing, run-time memory consumption and data structures, core optimization problem size and numerical integrity)
2-a	Total virtual MW quantity is only 10% above physical bids. Multiple runs with varied prices	Data setup in progress	Pending	Continue with data preparation
2-b	MW quantity for each virtual bid is the same as MW quantity of physical resource; multiple runs with varied prices	Data setup in progress	Pending	Continue with data preparation

Scenario 3 – Description

Item	Scenario Description	Market Rationale	Software Rationale
3	Create approx 9,000 additional bids and virtual resources to reach 10,000 total bids; run IFM application	Large scale CB participation	Test memory consumption and execution performance of selected IFM components (e.g. database sizing, run-time memory consumption and data structures, core optimization problem size and numerical integrity)
3-a	Balance load and supply bid count; virtual load bids on individual load nodes; multiple runs with varied prices	Impact on DA enargy and A/S prices in absence of virtual limits	Impact on power flow
3-b	Mimic the existing supply/ demand bid count ratios; Limited MW volumes	Large scale CB participation with constraining position limits	Impact on power flow

Scenario 3 – Preliminary Results

Item	Scenario description	Test Status	Things accomplished	To Do
3	Create approx 9,000 additional bids and virtual resources to reach 10,000 total bids; run IFM application	Scenario created for 3-b	Test and Software Development Environment partially moved to 64-bit environment to be able to allocate sufficient memory for problem of this size. Database sizing modified as well to be able to keep larger bid volume.	
3-a	Balance load and supply bid count; virtual load bids on individual load nodes; multiple runs with varied prices	Data work in progress	Impact on DAM Market Clearing Prices and Ancillary Services in absence of virtual limits	Continue with data preparation
3-b	Mimic the existing supply/ demand bid count ratios; Limited MW volumes	Data set created. Testing in progress. IFM solving reduced problem and without NA, but number of modules not being active	Such a large scale problem can not be solved in 32-bit environment based on software improvements only. It requires switching to 64-bit environment. Still issues with transfer to Network Applications and other selected software modules.	Resolve software issues so full run with Power Flow can be accomplished

Plans for Voltage Stability Testing

- Nodal limits: Power flow convergence Impact
- Voltage concerns and MW concerns

Resource IDs

- Pre-registering Resource IDs in the Master File will not be manageable for Convergence Bidding
  - 3,000 Locations * 2 Bid Types * 100 SCIDs = 600,000 potential Resource IDs
  - Options were discussed with Stakeholders in October 2008
- A revised straw proposal is posted on the website that refines the previously discussed options

  http://www.caiso.com/241d/241dd9014b820.pdf

Resource IDs

- Instead of creating a standing Resource ID, SCs would create the “Resource ID” directly in SIBR
  - Creation would be permitted either through the SIBR GUI or API
  - SCs would create a “composite key” sufficient to uniquely identify a Convergence Bid from submittal to settlement
- Proposed characteristics:
  - SCID
  - Pnode ID/APnode ID
  - Virtual Bid Indicator
  - Injection / Withdrawal Indicator
  - Trade Hour