CAISO Response to Silicon Valley Power Questions regarding IBAA modeling

January 26, 2009

Question #1: SVP has questions about the market simulation results related to pricing of IBAA imports to the CAISO. The attached file contains excerpts of results for certain IBAA import pricing nodes for the four structured simulation days (12/9 – 12/12) and for December 28, 2008.

During the structured simulation, there are hours in which the pricing at the IBAA nodes in the spreadsheet differs even though all of those nodes are mapped back as Captain Jack injections. We assume that they differ due to the modeling of additional, differing constraints for each of IBAA nodes (e.g., scheduling limit and flow limit constraints may be different at Lake than at Tracy). Can you explain the reason(s) for these observed differences during the structured simulation?

Response to Question #1:

The PNodes highlighted in the table (ELVERTAS_2_N009, LAKE_2_N025 and SMD4_ASR-APND) below are not mapped back to Captain Jack because these PNodes and APNode are for the purposes of mapping and distributing export schedules at RDM230 via the SMD4_ASR. The ELVERTAS_2_N009, LAKE_2_N025 PNodes exist as part of the SMD4_ASR Anode and APnode for the purpose of distributing IBAA export schedules and pricing of such schedules associated with RDM230 scheduling point. The SMD4_ASR-APND is an aggregate of nodes made up of ELVERTAS_2_N009, LAKE_2_N025, HURLEYS_2_N012, RNCHSECO_2_N016 PNodes.

Aside from the clarification above, the PNodes highlighted below are different from one another primarily because of binding congestion on the following transmission facility: 30300_TABLMTN _230_30325_PALERMO _230_BR_1 _1. The different physical PNodes are modeled separately and have a different impact on the binding congestion. The ISO did not map the highlighted PNodes back to another location with a separate price. Rather the ISO mapped schedules at scheduling points to the relevant IBAA PNodes.

PNODE_RESMRID	GRP_TYPE	HE21
CAPTJACK_5_N101	ALL	-42.4094
ELVERTAS_2_N009	ALL	-5.84876
LAKE_2_N025	ALL	4.59715
SMD4_ASR-APND	ALL_APNODES	-1.04364

Question #2: Beginning December 28, the CAISO increased the number of IBAA nodes mapped back to Captain Jack. Please explain the difference in the modeling assumptions for the period beginning December 28, 2008 as compared to the modeling assumptions immediately prior to that date.

Response to Question #2: On December 28, 2008, the ISO began using the DB38 model as part of MRTU market simulation. The ISO did not increase the number of IBAA nodes in this model. Instead, the ISO consolidated all of the Captain Jack nodes in the model into the Captain Jack station to better ensure robust power flow solutions. From October 26, 2008 up to and including December 27, 2008, the ISO modeled the following Captain Jack nodes associated with the IBAA interchange scheduling points:

ITC	TNAME	CNODE_RES_ID
COTP_ITC	TRCYCOTP	CJAKCOTP_5_N001
COTPISO_ITC	TRCYCOTPISO	CJAKIBA3_5_N001
CTW230_ITC	CTW230	CJAKIBA5_5_N001
LLNL_ITC	LLL115	CJAKIBA6_5_N001
RDM230_ITC	RDM230	CJAKIBA4_5_N001
RNCHLAKE_ITC	LAKE	CJAKIBA7_5_N001
RNCHLAKE_ITC	RANCHOSECO	CJAKIBA8_5_N001
TRACY230_ITC	TESLA230	CJAKIBA9_5_N001
TRACY500_ITC	TRCYPGAE	CJAKIBAA_5_N001
WESTLYLBNS_ITC	WESTLYLBNS	CJAKIBAC_5_N001
WESTLYTSLA_ITC	WESTLYTSLA	CJAKIBAB_5_N001

After December 28, 2008, the ISO modeled the following Captain Jack nodes associated with the IBAA interchange scheduling points:

ITC	TNAME	Pnode
COTP_ITC	TRCYCOTP	CAPTJACK_5_N015
COTPISO_ITC	TRCYCOTPISO	CAPTJACK_5_N512
CTW230_ITC	CTW230	CAPTJACK_5_N510
LLNL_ITC	LLL115	CAPTJACK_5_N509
RDM230_ITC	RDM230	CAPTJACK_5_N511
RNCHLAKE_ITC	LAKE	CAPTJACK_5_N508
RNCHLAKE_ITC	RANCHOSECO	CAPTJACK_5_N507
TRACY230_ITC	TESLA230	CAPTJACK_5_N506
TRACY500_ITC	TRCYPGAE	CAPTJACK_5_N505
WESTLYLBNS_ITC	WESTLYLBNS	CAPTJACK_5_N003
WESTLYTSLA_ITC	WESTLYTSLA	CAPTJACK_5_N504

Question #3: Since that date, during most hours, one of the Captain Jack pricing nodes shows significant, positive congestion components, while the other Captain Jack pricing nodes show no congestion or negative congestion components. We believe the Captain Jack pricing node with the positive congestion components is mapped from the SMUD intertie nodes. Is that correct? The positive congestion at this node implies that imports scheduled at this node have a positive impact on the CAISO grid (i.e., relieve congestion). We are therefore puzzled that the corresponding IBAA export node(s) for those hours do not show corresponding negative congestion. We also do not understand why other injections modeled at Captain Jack would not show the same congestion relief benefit, given that we would expect any injection modeled at Captain Jack to have the same effect on the modeled power flows. Can you explain why we do not see negative congestion in the export direction and why we don't see the same prices at all of the Captain Jack import pricing nodes?

Response to Question #3: The locational marginal price mapped back to the Captain Jack Pnode that reflects positive congestion results from export congestion at the following interchange point: RDM230_ITC (Intertie limit) because the RDM230_ITC has a 0 MW scheduling limit during these times. This scheduling limit may have resulted from a derate or a conflict between scheduling Existing Transmission Contract rights. The price at RDM230_ITC (PNode CAPTJACK_5_N511 and APNode SMD4_ASR-APND) reflects this export congestion. The other Captain Jack PNodes do not reflect the same price because they are not associated with the congested interchange RDM230_ITC scheduling limit. When the interchange scheduling limit is binding the PNode locations associated with both the imports and exports at the interchange will reflect the binding scheduling limit. Please note that this congestion is not flow-based congestion, but rather scheduling limit congestion. If there were only flow-based congestion at RDM230_ITC, then the congestion prices on all the IBAA PNodes at Captain Jack would reflect the same price.

In summary, the pricing approach is as follows:

Imports to the CAISO at each IBAA intertie will be settled using the specific PNode prices for each intertie for a given intertie allowing for more than one IBAA import price if (and only if) one or more of the IBAA intertie import scheduling limits is binding for that interval. In the absence of a binding scheduling limit, all the IBAA intertie import prices will be the same (except for the COTP Marginal Loss substitution). For exports from the CAISO, prices become a single IBBA export price (SMUD Hub default price). This export price may also differ for a given intertie if one or more scheduling limits are binding for that interval.

Question #4: Given that all IBAA imports to CAISO, absent a MEAA, are assumed to be sourced at the single IBAA proxy hub (Captain Jack), it seems counter-intuitive that there would be more than one IBAA import price. Could the existence of more than one IBAA import price (up to 16 import prices in the current model configuration, in addition to multiple IBAA export prices) lead to potential inappropriate scheduling incentives? Has the CAISO studied the market simulation results since the December 28 model change to identify any possible issues related to the development of the prices themselves or to the signals those prices might be sending to the market? If so, we would appreciate it if you would share those results with us and with other market participants. If not, we would appreciate it if the CAISO could investigate these issues and share its findings with all market participants.

Response to Question #4: As explained above in response to question #3, if a scheduling limit at an interchange point is binding, the PNode price associated with schedules at that particular interchange point will separate from the other PNode prices associated with other interchange points that do not have the same binding scheduling limit. As noted above, these scheduling limits are not the same as flow-based limits. The ISO's review of this issue reflects that prices at various interchange points that are mapped back to Captain Jack differ from each other when scheduling limits become binding and there is a scarcity of transmission scheduling capacity at some of the interchange points.

Question #5: In the DB38 Pnode Mapping file it is not obvious to which Pnode (or APNode) will be used to price the MCL for COTP imports for which losses are paid to TANC or Western. Please identify for the Pnode for Tracy that will reflect pure Tracy prices (as opposed to prices at Captain Jack), so that we can identify the Tracy MCL that will be substituted for the qualifying COTP transactions.

Response to Question #5: The PNode location that will be used for the Marginal Cost of Losses for those schedules that are certified as paying COTP losses to the Transmission Agency of Northern California or the Western Area Power Administration should be the Marginal Cost of Losses for the TRACY_5_N047 Pnode because the COTP Terminus is on the 500 KV side of the Tracy Substation. This PNode price is available in the ISO modeling results.

Question #6: Can you check on one other question? I'm wondering if the simulated telemetry now being used in the HASP and RTM MRTU simulations is simulating expected parallel flows on the interties or if it is still only simulating flows consistent with IFM schedules and HASP/RTM load changes? I believe that parallel flows from COTP schedules that sink outside the CAISO (in the IBAA) still are not being reflected in the HASP or RTM simulated telemetry feeds. Can you confirm if my understanding is correct?

Response to Question #6: During Market Simulation, the CAISO utilizes a simulated solution of the external model and load. As this does not reflect actual load and generation conditions externally, there is limited use of such simulated external data for the purpose of determining parallel flows. As a result, the parallel flows resulting from schedules that sink outside the CAISO (in the IBAA) were not reflected in market simulation. When actual telemetry is available then this would be the appropriate time to consider the actual parallel flows.