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## **TECHNICAL BULLETIN**

# **Price Corrections for Invalid Congestion in January 2013**

**August 2013**

## Revision History

Date	Version	Description	Author
2013-08-27	1.0		Guillermo Bautista Alderete

**Note:** *Consistent with Attachment G to the Business Practice Manual for Market Operations, the purpose of this technical bulletin is to provide the ISO's market participants with information concerning invalid congestion observed in certain real-time market runs in January 2013 in the Birds Landing area.*

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## Executive Summary

This technical bulletin provides an analysis of congestion observed in certain intervals of the real-time market in the Birds Landing area in January 2013. The ISO has determined that all of the prices for the real-time market intervals resulting from that congestion in January 9<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup> and 26<sup>th</sup> do not reflect true congestion on the system due to a defect in the software functionality for wind deviation adjustments. This issue was identified outside the existing five calendar window for price validation and correction and, therefore, the affected intervals were not previously subject to price corrections. The ISO estimates the market impact amounts to approximately \$6.6 million in excess charges for congestion, born by a small number of market participants. The ISO intends to seek a waiver of Section 35.2 direction from FERC to proceed with a post-five day price correction. The ISO seeks stakeholders comments by September 11, 2013, prior to submitting its request for a waiver with FERC. Please submit comments on the technical bulletin to [mi02pc@caiso.com](mailto:mi02pc@caiso.com).

## Background and Scope of Market Issue

Given the nature of the issue as described in this bulletin, the market issue impacted only the real-time market interval dispatch. This item did not affect the day-ahead market (DAM), the real-time pre-dispatch (RTPD), also referred to as the real-time unit commitment, or the hour ahead scheduling process (HASP). This issue impacted January 9<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup> and 26<sup>th</sup> for the intervals and constraints listed below in Table 1.

**Table 1: List of constraints that observed invalid congestion**

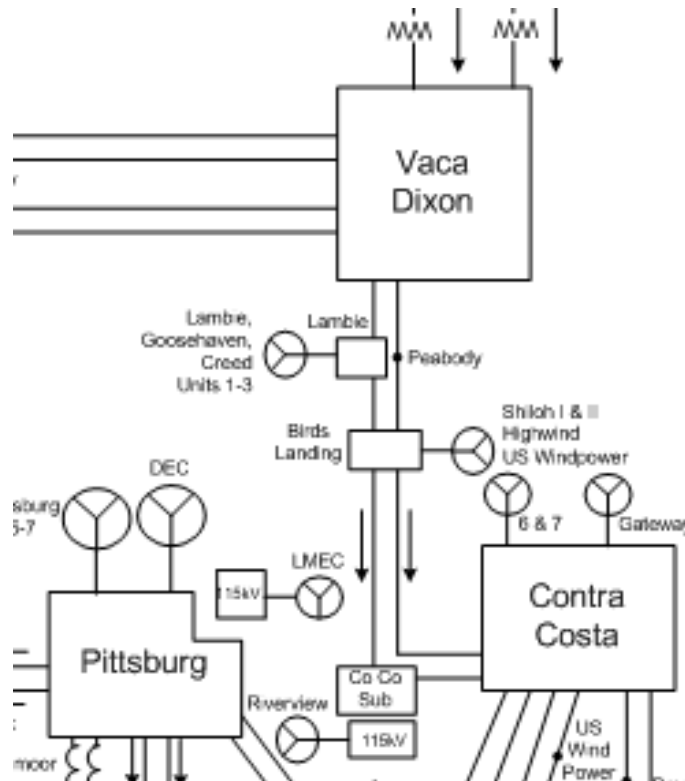
Period	Constraint	Contingency
Jan 9, HE18 Intervals 4-9	30460_VACA-DIX_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan 9, HE18 Intervals 4-9	30472_PEABODY_230_30529_BRDSLDNG_230_BR_1_1	mPG2-VACADX-LMBEPK
Jan 9, HE18 Intervals 4-9	30529_BRDSLDNG_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan13, HE22 Intervals 4-6, HE23 Int 7-12	30460_VACA-DIX_230_30472_PEABODY_230_BR_1_1	mPG2-VACADX-LMBEPK
Jan 13, HE22, HE23, HE24 Intervals 1-5	30460_VACA-DIX_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan 13, HE22, HE23, HE24 Intervals 1-6	30472_PEABODY_230_30529_BRDSLDNG_230_BR_1_1	mPG2-VACADX-LMBEPK
Jan 13, HE22, HE23, HE24 Intervals 1-6	30529_BRDSLDNG_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan 14, HE01, Interval 1	30472_PEABODY_230_30529_BRDSLDNG_230_BR_1_1	mPG2-VACADX-LMBEPK
Jan 14, HE01 Intervals 1-3, and HE02 Intervals 4, 6	30529_BRDSLDNG_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan 26, HE13 Intervals 7-8	30460_VACA-DIX_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD
Jan 26, HE13 Intervals 7-8	30472_PEABODY_230_30529_BRDSLDNG_230_BR_1_1	mPG2-VACADX-LMBEPK
Jan 26, HE13 Intervals 7-8	30529_BRDSLDNG_230_30478_LAMBIE_230_BR_1_1	mPG2-PEABDY-BRDSLD

While the same sets of transmission constraints discussed in this technical bulletin were congested at other times, the software issue described in this bulletin did not impact the results during these other periods or prices were corrected to within the standard price correction window. In July 12, 2012 in hour ending 24 there was congestion observed on these lines. While the software defect described in this bulletin had no impact on this congestion, the congestion on July 12, 2012 was deemed invalid because of incorrect modeling of a transmission outage and was corrected accordingly. Later on in February 2013 the same set of lines were congested. At that time, the ISO identified the software defect and performed price corrections within the standard price correction horizon. Most recently, in year 2013 these lines were congested intermittently in early July 2013 which was valid congestion as it was reflective of the actual system conditions; the software defect described in this bulletin had no impact on the congestion observed in July 2013.

## Market Issue

The congestion experienced in January, 2013 in the Birds Landing area was impacted by wind deviations observed on the system. In the real-time pre-dispatch markets, wind resources are dispatched based on their self-schedules. In the five minute real-time interval market, however, the ISO uses the actual wind production based on telemetry. The current market functionality allows the ISO to make an adjustment to the forecasted resource output in the real-time system for wind variability when there is a need to converge the projected self-schedules in the pre-dispatch market to the current observed production of wind. These wind imbalance adjustments are applied by wind zone. The congestion observed in the Birds Landing area is related to the wind production in that area. Figure 1 shows the configuration of the Birds Landing area. In January, there was a forced outage in the Birds Landing area that required the monitoring and enforcement of the different contingencies that were binding in the real-time market. This also contributed to congestion in those areas observed during that time frame.

Initially, the ISO deemed the congestion it observed as valid because it expected some degree of congestion given the system conditions and outages it observed in those areas at that time. The software defect was not identified and, therefore, the invalid congestion was not corrected through the price validation and correction process carried out within the five calendar day window.



**Figure 1: Transmission configuration in the Birds Landing area**

The congestion on these elements was observed again in early February and by that time the ISO had identified that there was a software defect impacting the wind adjustment functionality. The software defect that existed in the logic was counting the wind adjustment in the five-minute real-time dispatch on top of the actual wind output. For the instances experienced in February, which were within the five day time horizon for price corrections, the ISO validated the congestion and proceeded with price corrections associated with these constraints. By that time, the instances of this congestion observed in January were not subject to price corrections because they were outside the allowed time horizon of five calendar days.

## Market Impact Assessment

The ISO assessed the market impact of this invalid congestion for the three days observed in January. With excessive flows on the constraints, the shadow prices were in most of the instances at \$1000; and these shadow prices were propagated according to the shift factors to the various locations. There were approximately 60 pricing locations that observed a congestion component from any of the four transmission constraints that incurred the invalid congestion, as shown in Table 2. This in turn may have impacted to some level the congestion at the DLAP\_PGE and trading hub NP15.

**Table 2: Pricing locations impacted by invalid congestion in real time on January 2013**

NODE_NAME	NODE_NAME
ANTIOCH_6_N001	LMBIGENT_2_N004
BALFOUR_6_N001	MTZUMA2_7_B1
BRDSLNG_2_N044	PEABODY_2_GN001
BRIONES_6_N001	PEABODY_2_GN002
CCJCT1_1_B1	PEABODY_2_GN003
CCSUB_1_GN001	PEABODY_2_GN004
CCSUB_1_GN002	PEABODY_2_GN005
CCSUB_1_GN003	PEABODY_2_GN006
CCSUB_1_GN004	PEABODY_2_GN007
CCSUB_1_GN005	PEABODY_2_GN008
CCSUB_1_GN006	PEABODY_2_GN009
CCSUB_1_GN007	PEABODY_2_N001
CCSUB_1_GN008	PEABODY_2_N002
CCSUB_1_GN009	PEABODY_2_N006
CCSUB_1_N001	PEABODY_2_N010
CCSUB_1_N034	PEABODY_2_N024
CCSUB_2_N001	PGE2_PDRP02-APND
CCSUB_2_N010	PITTSBRG_6_N101
CCSUB_2_N025	PLSNTGR_6_N012
CCSUB_2_N029	POD_LMBEPK_2_UNITA1-APND
CCSUB_2_N030	POD_LMBEPK_2_UNITA2-APND
CCSUB_2_N031	POD_LMBEPK_2_UNITA3-APND
CCSUB_6_B1	POD_RVRVEW_1_UNITA1-APND
CCSUB_6_N024	POTRERO3_7_B1
CREEDGT1_7_GN001	RIVERVIEW_1_N003
DOMTAR_1_N001	RIVERVG1_7_B1
DUPONT_6_N001	RUSSEL_7_N007
FIBRJCT_1_B1	SHILO_7_N002
GOOSEHGT_7_GN001	SHILOH_7_B1
GWF#1_7_B1	SHILOH3_7_N002



GWF#3_7_B1	SHILOH3B_7_N001
GWF#4_7_N001	SHLLCHM_6_N001
HIGHWND3_7_GN001	SHLLCHMT_6_B1
HIGHWINDS_7_B1	SLAP_PGEB-APND
LAMBGT1_7_B1	SLAP_PGSA-APND
LAMBIE_2_B1	USWINDPW_7_N001
LAMBIE_2_N010	USWINDPW_7_N002
LMBIGENT_2_N003	WLLWPSS_6_N001

Wind locations that are electrically close to these constraints saw a compounded congestion component for when the various constraints bound concurrently, reaching in certain instances prices in the range of negative \$3,000 in the five-minute real-time market. Based on the current settlements for these market intervals provided in Table 1, which reflects the original \$1000 shadow prices of these constraints, an analysis is done assuming that if a price correction is implemented the resulting LMPs would be about -\$30/MWh.<sup>1</sup>

Table 3 shows the summary of the impact of price corrections by trading date. These values show the net difference between the original settlement and the recalculated settlement if prices corrections were implemented.

**Table 3: Estimate of total market impact if price corrections were implemented**

Trade Date	Market Impact
1/9/2013	-\$673,787
1/13/2013	-\$5,652,151
1/14/2013	-\$82,315
1/26/2013	-\$236,205

<sup>1</sup> The determination of the actual price to be used for correction will require adjusting accordingly the shadow price of these constraints to the expected level; in most instances, the shadow prices will be fully zero out, but in other instances the shadow prices may reduce from \$1000 to about \$60, as some congestion was still in place. This in turn will adjust accordingly the marginal congestion component of the LMP of the affected nodes. The price -\$30 LMP is used in this analysis as a reference to estimate the impact of the resulting price correction. This approach is taken because the price corrections would actually have to be implemented for every interval affected to obtain the recalculation of settlements with the resulting prices in order to precisely quantify the exact impact.

Based on this calculation, a price correction would result in a payment to participants in the amount of \$6.6 million. Depending on the participants' position, the bulk of payments would be concentrated in less than five participants. There would also be charges of about \$90,000 allocated to another set of participants less directly impacted.

This payment to participants in the amount of \$6.6 million would be coming from the negation of congestion offset charges incurred in the original settlement due to the heavily negative LMPs resulting from invalid congestion. In the original settlement there was a surplus in the real-time market congestion offset account, which was allocated to measured demand in order to maintain revenue neutrality as illustrated in Table 4.

**Table 4: Congestion offset paid to measured demand in original settlement**

<b>1/9/2013</b>	<b>1/13/2013</b>	<b>1/14/2013</b>	<b>1/26/2013</b>
-\$650,745	-\$5,800,419	-\$110,137	-\$238,613

A negative value of the congestion offset means that load serving entities received a payment in the original settlement. Implementing the price corrections will require resettlement of the market for those days based on the corrected prices and will reverse these payments previously made to load serving entities generally. However, the net impact on each market participant will depend on the degree of supply and demand positions they held in the market on those days.

## Next Steps

Consistent with Tariff Section 35 and Section 8 of the Business Practice Manual for Market Operations, because the erroneous congestion was not identified within the five day price corrections time period, the ISO did not implement price correction for the invalid congestion observed in January, 2013 in the Birds Landing area. However, as the results presented in this report indicate, the impact of the invalid congestion is not negligible and the burden of this impact is borne by a small number of market participants. Based on the evaluation of this item, the ISO concludes that this instance meets the threefold criteria set forth in guidelines it adopted in Attachment G of the Business Practice Manual in considering whether to pursue a post-five day price correction. Consistent with the tariff requirements, the ISO will seek a waiver of its tariff requirements from FERC to implement a price correction outside the five day time horizon. In this regard, the ISO requests feedback from market participants about this market issue and the direction the ISO intends to pursue in seeking direction from FERC to implement a post five day price correction. Written comments can be submitted to [mi02pc@caiso.com](mailto:mi02pc@caiso.com) by September 11<sup>th</sup>, 2013.