



Discussion of Proposed Price Correction: DC_N Settlement Point (November 24, 2011)

John Dumas

Director, Wholesale Market Operations

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- **Protocol 6.3 states that all Real-Time prices are final at 1600 of the next Business Day after the Operating Day. The Protocols provide that final prices may only be corrected if the ERCOT Board finds that Real-Time Prices “are significantly affected by a software or data error.”**
- **ERCOT data indicates that Real-Time Prices were significantly affected by an error in the heuristic table that determined the price for DC Tie North when DC Tie North was de-energized.**
 - The heuristic table contained buses that were also de-energized due to outages
 - Additional data in the heuristic table could have provided an appropriate price at DC Tie North when it was de-energized

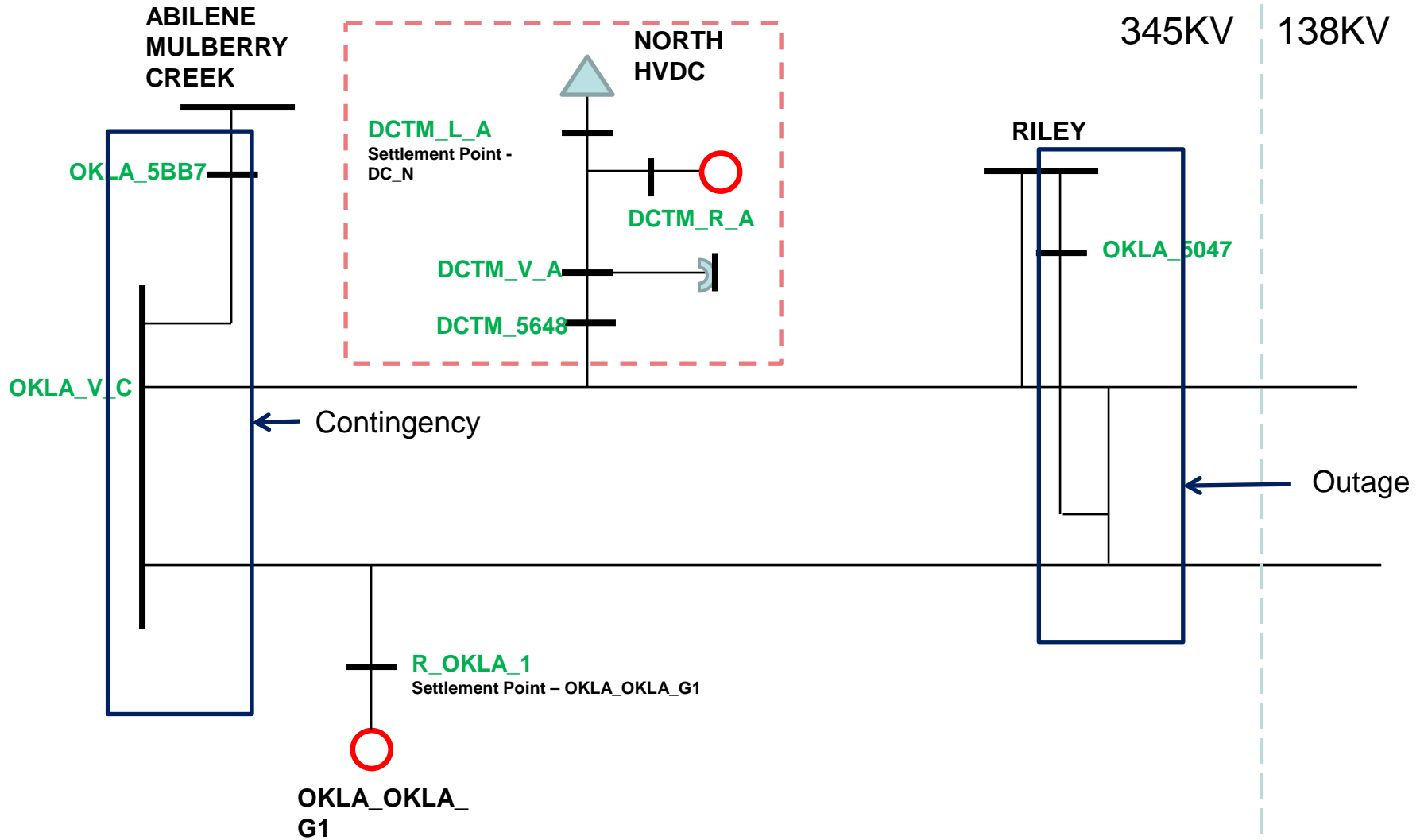
“Heuristic Rule” Background

- **ERCOT submitted NPRR 339 after experiencing the “dead bus” issues that resulted in a price correction approved by the Board in April 2011.**
- **NPRR 339 corrected problems that resulted in heuristic rules failing to properly set prices at a de-energized bus under certain conditions. NPRR 339 added the following language to the heuristic rules in section 6.6.1 *Real-Time Settlement Point Prices*:**
 - “Use an appropriate LMP predetermined by ERCOT as applicable to a specific Electrical Bus; or if not so specified”
 - This language allowed ERCOT to develop a table with buses that would be used to more appropriately set the price at a de-energized bus

- **ERCOT also submitted NPRR 343 which updated Protocol section 4.4.6.1 to state that:**
 - A Point-to-Point Obligation bid shall not contain a source Settlement Point and a sink Settlement Point that are Electrically Similar Settlement Points.
- **Protocol 2.1 defines “Electrically Similar Settlement Points” as:**
 - Two or more distinct Settlement Points that are either mapped to the same electrical location in a market model or are mapped to locations that are connected by a transmission element with a reactance of less than 0.0005 per unit and a rating of more than 9000 MVA.
- **The North DC Tie de-energized bus involved in the November 24, 2011 situation did not meet the “Electrically Similar Settlement Points” criteria.**

ERCOT is Requesting a Price Correction for the North DC Tie Settlement Point

- **ERCOT observed aberrational prices for the North DC Tie**
 - PTP Obligations between OKLA_OKLA_G1 and DC_N resulted in a payout of approximately \$4.5 Million
 - The settlement points at OKLA_OKLA_G1 and DC_N are connected by transmission elements that are electrically close, and therefore should not have different prices due to congestion
- **DC_N settlement point (Electrical Buses DCTM_L_A) became de-energized due to a software calculation error which disconnected DC_N settlement point from the grid when there were no exports across the DC Tie.**
 - The heuristic rule table, which identifies the buses that set the price at DC_N when DC_N is de-energized, did not include sufficient data (due to outages at the Oklaunion station)
 - The outages at Oklaunion resulted in the software program de-energizing buses (OKLA_5047 and OKLA_5BB7) in the heuristic table
- **Solution to resolve software and data error**
 - Revised the software calculation to not de-energize the DC Tie when not exporting energy
 - Correct the LMP at DCTM_L_A when it is de-energized to LMP at DCTM_R_A, DCTM_V_A and OKLA_OKLA_G1, thus reversing the payout of \$4.5 Million on the PTP Obligation
 - Add more Electrical Buses to the dead-bus heuristic rule mapping table by including DCTM_V_A



- DC_N was mapped to DCTM_L_A
- OKLA_OKLA_G1 was mapped to R_OKLA_1
- DCTM_L_A, if dead, would be mapped to OKLA_5047 and OKLA_5BB7

Comparison of Pricing Schemes Among ISOs

New York ISO	Midwest ISO	ERCOT	ISO New England	PJM	CAISO
Ex-Ante	Ex-Post	Ex-Ante	Ex-Post	Ex-Post	Ex-Ante

Timeline for Price Corrections Among ISOs

New York ISO	Midwest ISO	ERCOT	ISO New England	PJM	CAISO
<p>One (1) day to reserve prices</p> <p>Three (3) calendar days for investigation and correction</p>	<p>Five (5) business days</p>	<p>One (1) business day</p>	<p>Five (5) business days for real-time, three (3) business days for day-ahead</p>	<p>One (1) business day for normal verification</p> <p>Two (2) business days for notification</p> <p>Ten (10) calendar days for corrections</p>	<p>Five calendar days for validation and correction</p>

Table information taken from CAISO presentation “Market Performance and Planning Forum” on 1/30/12