# Correction to Typographical Error in the Adjusted Regulation Performance Cost Equation in Section 3.2.7 of M-11

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Real-Time Market Operations

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- <u>Mileage Ratio</u> rather than <u>Mileage</u> has been used incorrectly in:
  - ➢ Section 3.2.7 of Manual 11;
  - ➢ Section 2.8 of Manual 15;
  - ➢ Regulation Cost Validation spreadsheet on PJM website (http://www.pjm.com/markets-and-operations/ancillary-services/mkt-based-regulation.aspx)

- The issue can be described as clerical error in documentation

- <u>None</u> of the Regulation Market processes ranging from participant offer data in eMKT to the regulation credit in Settlement is affected

- The clerical error might have caused confusion for some market participants trying to create offering model

❑ <u>Mileage</u> is the summation of movement requested by the PJM Regulation control signal a resource is following. It represents the sum of absolute value of up and down movement that resources provided in response to Regulation requests. Mileage is in ΔMW/MW for a specific regulation signal type

❑ <u>Mileage Ratio</u> is the ratio between the requested mileage for the PJM Regulation dispatch signal assigned to the Regulation resource and the Regulation dispatch signal assigned to traditional resources.
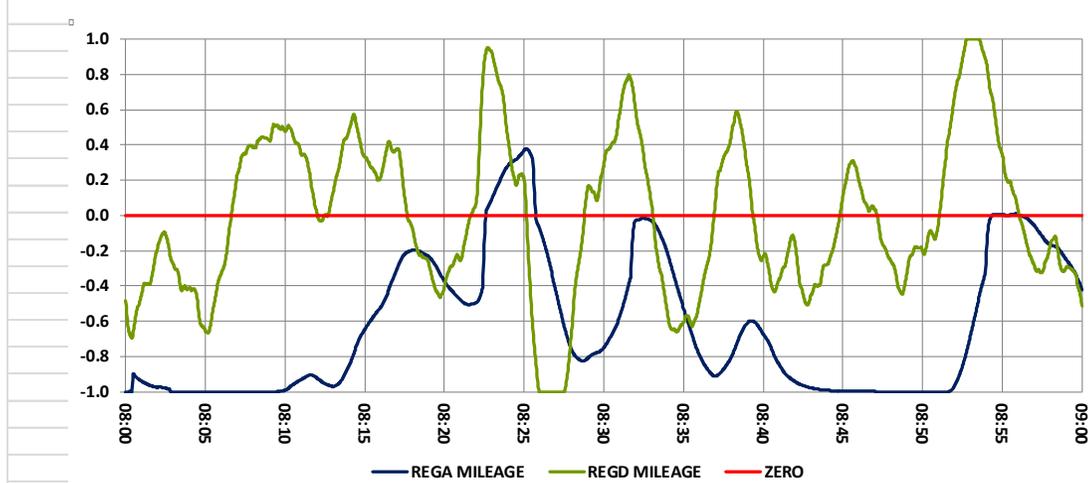
$$Mileage_{RegA} = \sum_{i=0}^{n} |RegA_i - RegA_{i-1}|$$

$$Mileage_{RegD} = \sum_{i=0}^{n} |RegD_i - RegD_{i-1}|$$

REGA MILEAGE	REGD MILEAGE	MILEAGE RATIO
6.972704	20.89501	2.996686

Messages	Reports	Node List	Market Results Energy	Market Results A/S

Regulation Results	Synchronized Reserve Results	Primary Reserve Results	DA Scheduling Reserve Results

Regulation Results Search

Area: PJM_RTO ▼ Date: (mm/dd/yyyy) 07/21/2014 Change Date
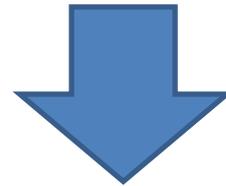
Get Report

Get CSV Report

Regulation Results for 07/21/2014

Hour	Requirement	RegD Self Scheduled Effective MW	RegA Self Scheduled Effective MW	RegD Procured Effective MW	RegA Procured Effective MW	Total	Deficiency	RTO Avg Performance Score	Reg A Mileage	Reg D Mileage
01	525	122.5	231.5	53.7	117.3	525	0	0.83	6.40	16.3
02	525	122	231.5	53.4	118.1	525	0	0.80	6.40	16.3

Change from

$$Adjusted\ Regulation\ Performance\ Cost\ (\$) = \frac{\left(Performance\ Offer\ \left(\frac{\$}{\Delta MW}\right)\right)}{\left(\begin{matrix}Benefits\ Factor \\ of \\ Offered\ Resources\end{matrix}\right)} * \frac{\left(\begin{matrix}\text{Mileage Ratio} \\ of \\ Offered\ Resource\ Signal\ Type\ \left(\frac{\Delta MW}{MW}\right)\end{matrix}\right)}{\left(\begin{matrix}Historic \\ Performance \\ Score\end{matrix}\right)} * \left(\begin{matrix}Capability \\ (MW)\end{matrix}\right)$$

Change to

$$Adjusted\ Regulation\ Performance\ Cost\ (\$) = \frac{\left(Performance\ Offer\ \left(\frac{\$}{\Delta MW}\right)\right)}{\left(\begin{matrix}Benefits\ Factor \\ of \\ Offered\ Resources\end{matrix}\right)} * \frac{\left(\begin{matrix}\text{Mileage} \\ of \\ Offered\ Resource\ Signal\ Type\ \left(\frac{\Delta MW}{MW}\right)\end{matrix}\right)}{\left(\begin{matrix}Historic \\ Performance \\ Score\end{matrix}\right)} * \left(\begin{matrix}Capability \\ (MW)\end{matrix}\right)$$

- Mileage Ratio is used in Settlement to credit owner of a regulation resource that actively follows the PJM's Regulation signals and instructions.

- This is currently done correctly.

20140720.csv [Read-Only]

	A	B	C	D	E	F	G	H	I	J
1	Real Time Hourly LMP Values for 20140720									
2										
3	Start of Ancillary Service MCP Data	100	200	300	400	500	600	700	800	900
4	RTO Regulation Performance	5.23	1.25	4.39	1.89	2.7	2.19	2.75	3.77	4.79
5	RTO Regulation Capability	4.09	7.17	6.39	15.04	14.23	28.45	36.08	18.01	25.6
6	**RTO Mileage Ratio**	**1.795729**	**1.641312**	**2.200802**	**5.709711**	**3.650921**	**5.140963**	**3.455473**	**2.412782**	**2.404533**