

Mileage Ratio Issue

MIC

July 14, 2021

IMM



Monitoring Analytics

Regulation Mileage Issue

- **The issue is that the mileage ratio is undefined or unreasonably high.**
- **The IMM proposes a cap of 5.5 on the realized mileage ratio in all hours to address the short term issue.**
- **The cap would eliminate the current undefined mileage ratio result.**
- **The cap would reduce the market distortion that results from the use of mileage ratios when they incorrectly represent regulation output.**
- **Based on data from January 1, 2020, through March 31, 2021 this cap would affect about 50 percent of hours.**



Regulation Mileage Issue

- **RegA resources are paid (on a performance score adjusted basis):**
 - **RegA MW x RMCCP + RegA MW x RMPCP.**
- **RegD resources are paid (on a performance score adjusted basis):**
 - **RegD MW x RMCCP + RegD MW x RMPCP x Mileage Ratio.**
- **Mileage Ratio = (Mileage of RegD)/(Mileage of RegA)**

Regulation Mileage Issue

- **RegA and RegD signals are interdependent.**
- **RegA moves to maintain ACE and to support the 30 minute conditional neutrality of RegD.**
- **The combination of the RegA and RegD signal maintains ACE.**
- **There are times when the RegA signal does not change (pegging), while the RegD signal moves.**



Regulation Mileage Issue

- **30 minute neutrality means that the RegD resource signal to go up and down is fully offsetting every 30 minutes. (Up time = down time)**
 - **This allows batteries to discharge (reg up) for no more than a maximum of 15 consecutive minutes.**
- **Conditional neutrality means that there can be exceptions to the neutral signal if RegD signal is pegged for longer than 15 minutes .**
 - **Resources can avoid performance degradation by leaving hourly market in mid hour (deselection).**

Regulation Mileage Issue

- **The RegA signal to support the conditional neutrality of RegD can cause large and/or undefined values for the mileage ratio (mileage D/mileage A).**
- **When RegA is pegged for a full hour (mileage of Reg A = 0), the mileage ratio is undefined.**
- **High mileage ratios do not reflect the amount of work done by RegA and RegD.**

Regulation Mileage Issue

- **The mileage ratio is not a measure of relative work done for purposed of supporting ACE control, as the full interaction between the A and D signals controls ACE.**
- **When pegged, for instance, RegA is still supporting ACE control (per the signal design) and it is also supporting the conditional neutrality of the RegD signal.**
- **RegA supports conditional neutrality of RegD even when RegA not pegged.**



Regulation Mileage Issue

- **The relative contribution to regulation is measured by the MRTS or MBF, not the mileage ratio.**
- **The MRTS/MBF is used for the relative valuation of RegA and RegD in the market clearing and in the price setting, but not in the market settlement.**
- **The current market design is flawed and causes an overpayment of RegD relative to RegA in most hours.**



Mileage Ratio Statistics: January 1, 2020, to March 31, 2021 (Cap at 1.0)

Full Range Statistics (no limits or caps on mileage or mileage ratios)						
	RegA	RegD	Mileage		\$/Reg A	\$/Reg D
Metric	Mileage	mileage	Ratio	MBF	MW	MW
Minimum	0.00	1.29	0.65	0.65	0.00	0.00
Maximum	14.29	59.71	9,999.00	1.94	967.86	969.97
Median	5.29	29.13	5.47	0.94	9.57	12.46
Mean	5.43	29.08	7.39	0.71	13.65	16.71
Statistics if Max Mileage Ratio Limited to				1		
	RegA	RegD	Mileage		\$/Reg A	\$/Reg D
Metric	Mileage	mileage	Ratio	MBF	MW	MW
Minimum	0.00	1.29	0.65	0.65	0.00	0.00
Maximum	14.29	59.71	1.00	1.94	967.86	967.86
Median	5.29	29.13	1.00	0.94	9.57	9.57
Mean	5.43	29.08	1.00	0.71	13.65	13.66
Percent of Hours Affected						
99.99%						

Mileage Ratio Statistics: January 1, 2020, to March 31, 2021 (Cap at 5.5)

Full Range Statistics (no limits or caps on mileage or mileage ratios)						
	RegA	RegD	Mileage		\$/Reg A	\$/Reg D
Metric	Mileage	mileage	Ratio	MBF	MW	MW
Minimum	0.00	1.29	0.65	0.65	0.00	0.00
Maximum	14.29	59.71	9,999.00	1.94	967.86	969.97
Median	5.29	29.13	5.47	0.94	9.57	12.46
Mean	5.43	29.08	7.39	0.71	13.65	16.71
Statistics if Max Mileage Ratio Limited to				5.5		
	RegA	RegD	Mileage		\$/Reg A	\$/Reg D
Metric	Mileage	mileage	Ratio	MBF	MW	MW
Minimum	0.00	1.29	0.65	0.65	0.00	0.00
Maximum	14.29	59.71	5.50	1.94	967.86	969.53
Median	5.29	29.13	5.47	0.94	9.57	12.02
Mean	5.43	29.08	4.87	0.71	13.65	16.22
Percent of Hours						
Affected	49.66%					

RegD Overpayment per Effective MW

RegD Settlement Payments							
Year	Month	Marginal Rate of Technical		RegA (\$/Effective MW)	Percent RegD Overpayment (\$/Effective MW)	Total RegD Overpayment (\$)	
		Mileage Based RegD (\$/Effective MW)	Substitution Based RegD (\$/Effective MW)				
2020	Jan	\$19.61	\$13.05	\$13.05	50.3%	\$3,822,718	
	Feb	\$25.79	\$9.57	\$9.57	169.5%	\$6,060,440	
	Mar	\$29.47	\$8.60	\$8.60	242.6%	\$7,982,625	
	Apr	\$38.85	\$11.45	\$11.45	239.4%	\$8,946,335	
	May	\$37.37	\$12.46	\$12.46	199.9%	\$8,953,641	
	Jun	\$25.00	\$11.85	\$11.85	111.0%	\$6,584,760	
	Jul	\$34.99	\$15.63	\$15.63	123.9%	\$7,891,533	
	Aug	\$31.78	\$14.83	\$14.83	114.4%	\$9,038,391	
	Sep	\$28.51	\$10.33	\$10.33	175.9%	\$7,942,871	
	Oct	\$69.18	\$17.31	\$17.31	299.6%	\$18,415,455	
	Nov	\$63.11	\$15.25	\$15.25	313.8%	\$15,834,343	
	Dec	\$43.39	\$15.34	\$15.34	182.9%	\$10,642,479	
	Yearly		\$37.30	\$13.00	\$13.00	186.9%	\$112,115,592
2021	Jan	\$30.47	\$11.43	\$11.43	166.6%	\$6,700,761	
	Feb	\$88.91	\$19.90	\$19.90	346.7%	\$15,723,391	
	Mar	\$61.03	\$17.93	\$17.93	240.4%	\$15,334,201	
Average		\$59.18	\$16.30	\$16.30	263.0%	\$37,758,352	

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