



**DATE:** March 1, 2018  
**TO:** PJM Market Sellers  
**FROM:** Independent Market Monitor for PJM  
**SUBJECT:** Incorrect Calculation of VOM Costs

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In reviewing the VOM costs approved by PJM, the IMM identified an error in the calculation of VOM costs for many units that do not have a complete 10 year maintenance history. The error overstates the VOM costs. The error results from applying average costs from years with available data to prior years, for which data are not available. The inflation escalation factor, based on the Handy Whitman Index, was inappropriately applied to years with incomplete data. The resulting calculation is not consistent with Manual 15.

For example, hypothetical unit A has only two years of historic VOM cost data. The proper calculation applies the inflation escalation factor to adjust actual historic costs for inflation.

**Correct Calculation of Hypothetical Unit A VOM Cost**

|                  | Annual VOM Costs   | Handy Whitman Escalation Factor | Escalated Annual VOM Cost          | Annual MWh             |
|------------------|--------------------|---------------------------------|------------------------------------|------------------------|
| 2017             | \$2,000,000        | 1.000                           | \$2,000,000                        | 100,000                |
| 2016             | \$1,000,000        | 1.034                           | \$1,034,000                        | 200,000                |
| 2015             | \$0                | 1.054                           | \$0                                | -                      |
| 2014             | \$0                | 1.098                           | \$0                                | -                      |
| 2013             | \$0                | 1.130                           | \$0                                | -                      |
| 2012             | \$0                | 1.144                           | \$0                                | -                      |
| 2011             | \$0                | 1.170                           | \$0                                | -                      |
| 2010             | \$0                | 1.222                           | \$0                                | -                      |
| 2009             | \$0                | 1.277                           | \$0                                | -                      |
| 2008             | \$0                | 1.238                           | \$0                                | -                      |
| <b>TOTAL</b>     | <b>\$3,000,000</b> |                                 | <b>\$3,034,000</b>                 | <b>300,000</b>         |
| Average VOM Cost |                    |                                 | $\$3034000 / 300000 \text{ MWh} =$ | <b>\$10.11 per MWh</b> |

In the incorrect calculation for Unit A, the average annual VOM cost and average annual output for 2017 and 2016 are applied to the years without data, 2008 through 2015. Although the average VOM cost is denominated in 2016/2017 dollars, it is escalated for inflation as if it were denominated in historic dollars. The escalation results in an overstatement of VOM costs.

### Incorrect Calculation of Hypothetical Unit A VOM Cost

|              | Annual VOM Costs    | Handy Whitman Escalation Factor | Escalated Annual VOM Cost                                    | Annual MWh       |
|--------------|---------------------|---------------------------------|--|------------------|
| 2017         | \$2,000,000         | 1.000                           | \$2,000,000  | 100,000          |
| 2016         | \$1,000,000         | 1.034                           | \$1,034,000  | 200,000          |
| 2015         | \$1,500,000         | 1.054                           | \$1,581,000  | 150,000          |
| 2014         | \$1,500,000         | 1.098                           | \$1,647,000  | 150,000          |
| 2013         | \$1,500,000         | 1.130                           | \$1,695,000  | 150,000          |
| 2012         | \$1,500,000         | 1.144                           | \$1,716,000  | 150,000          |
| 2011         | \$1,500,000         | 1.170                           | \$1,755,000  | 150,000          |
| 2010         | \$1,500,000         | 1.222                           | \$1,833,000  | 150,000          |
| 2009         | \$1,500,000         | 1.277                           | \$1,915,500  | 150,000          |
| 2008         | \$1,500,000         | 1.238                           | \$1,857,000  | 150,000          |
| <b>TOTAL</b> | <b>\$15,000,000</b> |                                 | <b>\$17,033,500</b>  | <b>1,500,000</b> |
|              |                     |                                 | $\$17033500 / 1500000 \text{ MWh} = \$11.36 \text{ per MWh}$ |                  |

In this example, Unit A's VOM cost is overstated by 12 percent, \$11.36 per MWh versus \$10.11 per MWh.

The IMM recommends that all Market Sellers that calculated their VOM costs using the incorrect method, recalculate their VOM costs using the correct method. This should be done as soon as possible since the error overstates the VOM costs.

The IMM's position is that only short run marginal costs are includable in the VOM component of a competitive cost based energy offer. Offers in excess of short run marginal cost create potential market power issues. The calculation issue results in an error regardless of whether VOM costs exceed short run marginal costs.

If you have any questions, please contact the IMM by email at [MMU\\_Energy\\_Offers\\_Review@monitoringanalytics.com](mailto:MMU_Energy_Offers_Review@monitoringanalytics.com).