

Performance Score

Regulation Market Issues Senior
Task Force

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Performance Compliance

- Working to enhance/improve performance scoring for regulation
 - Performance Score Calculation (*Matrix Item 15, 16, 16A, 16B, 16C*)
 - Regulation Participation Threshold (*Matrix Item 17, 18B*)
 - Regulation Qualification Testing (*Matrix Item 14*)

- Performance Score Calculation: Re-evaluated the calculation of accuracy, delay and precision and the inclusion of all three components
 - Using all components in performance scoring captures resource performance effectively when resources are following the signal fairly well, but does not do a good job during periods of poor performance
 - Value in keeping status quo equation to be able to capture signal correlation, timeliness and absolute error
 - Proposing an initial threshold evaluation on precision before scoring resources to better capture periods of poor performance
 - If precision score $> 75\%$, score interval status quo $(1/3A + 1/3D + 1/3P)$
 - If precision score $< 75\%$, score interval as precision only $(1/3*0 + 1/3* 0 + 1/3P)$

- Performance Score Calculation
 - Status Quo: 1/3 accuracy + 1/3 delay + 1/3 precision
 - Equations will stay status quo

Accuracy & Delay Calculation:

$$\text{Correlation Score}_{\delta=0 \text{ to } 5 \text{ Min}} = r_{\text{Signal, Response}(\delta, \delta+5\text{Min})}$$

$$\text{Delay Score} = \text{Abs} \left| \frac{\delta - 5 \text{ Minutes}}{5 \text{ Minutes}} \right|$$

Precision Calculation:

$$\text{Error} = \text{Avg of Abs} \left| \frac{\text{Response} - \text{Regulation Signal}}{\text{Hourly Average Regulation Signal}} \right|$$

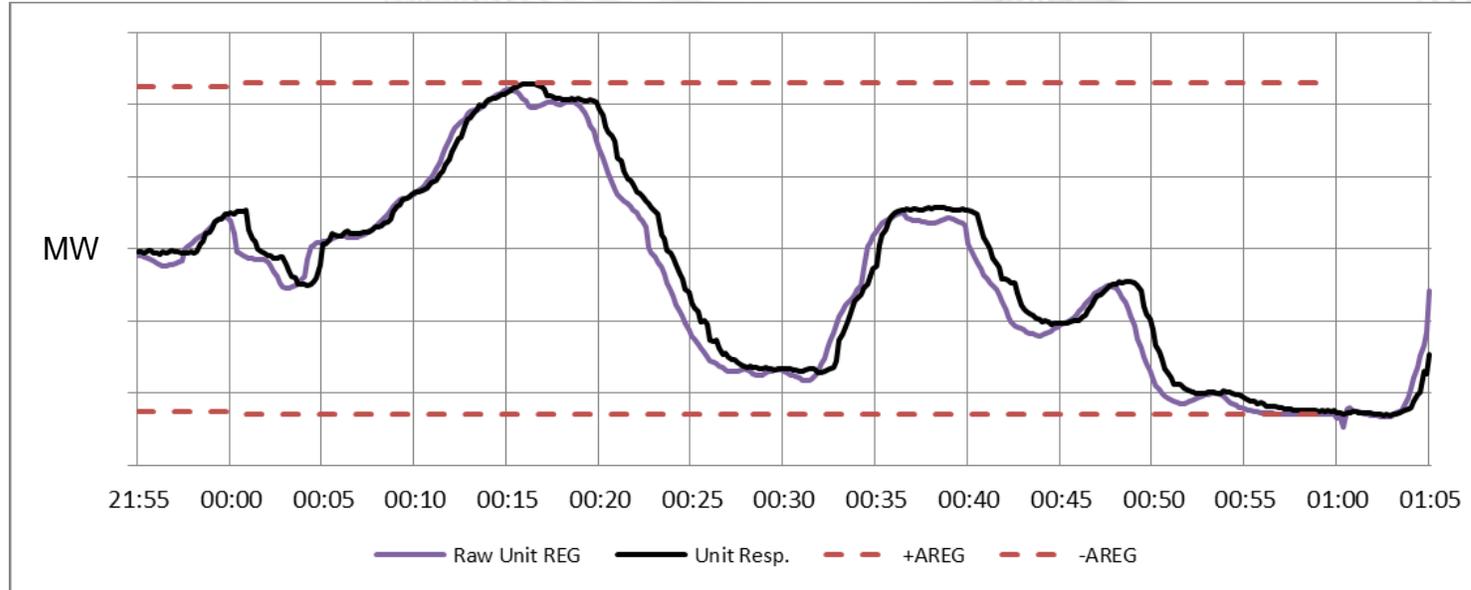
$$\text{Precision Score} = 1 - \frac{1}{n} \sum \text{Abs}(\text{Error})$$

	Current	75% threshold	75% threshold, no precision
Performance Calculation	$\frac{1}{3} A + \frac{1}{3} D + \frac{1}{3} P$	<p>If $P < 75\%$ $0 + 0 + \frac{1}{3}P$</p> <p>If $P > 75\%$ $\frac{1}{3} A + \frac{1}{3} D + \frac{1}{3} P$</p>	<p>If $P < 75\%$ $0 + 0 + 0$</p> <p>If $P > 75\%$ $\frac{1}{3} A + \frac{1}{3} D + \frac{1}{3} P$</p>

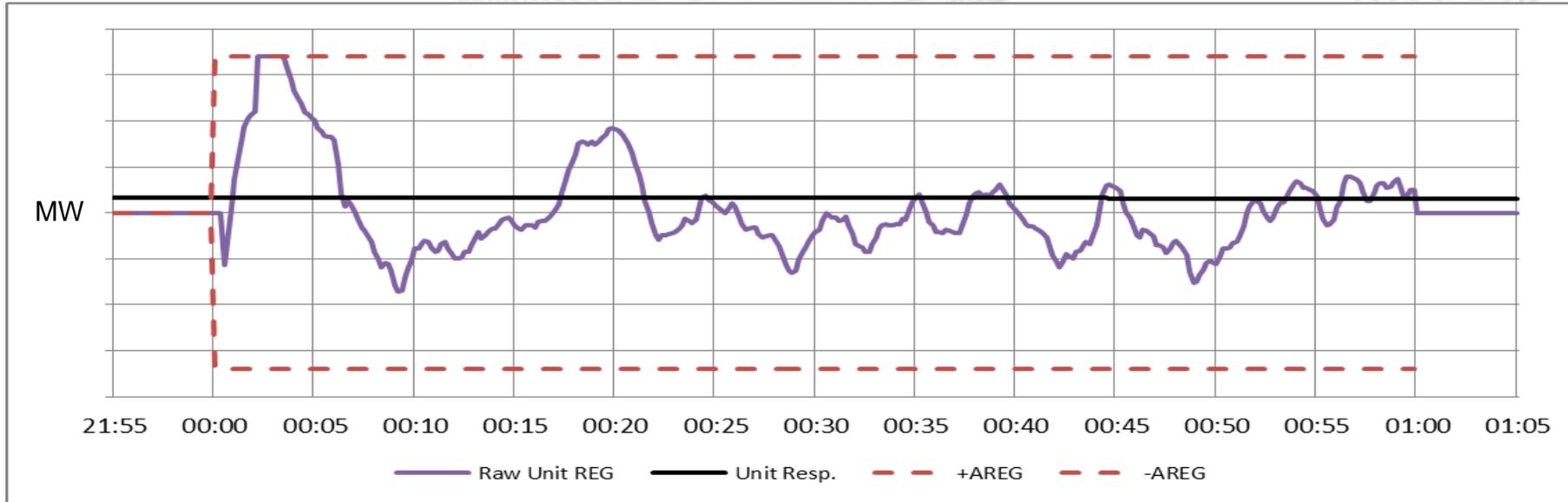
Scoring equations are used on a 10-second interval basis, each component is then averaged for the hour for overall performance score

A = Accuracy
 D = Delay
 P = Precision

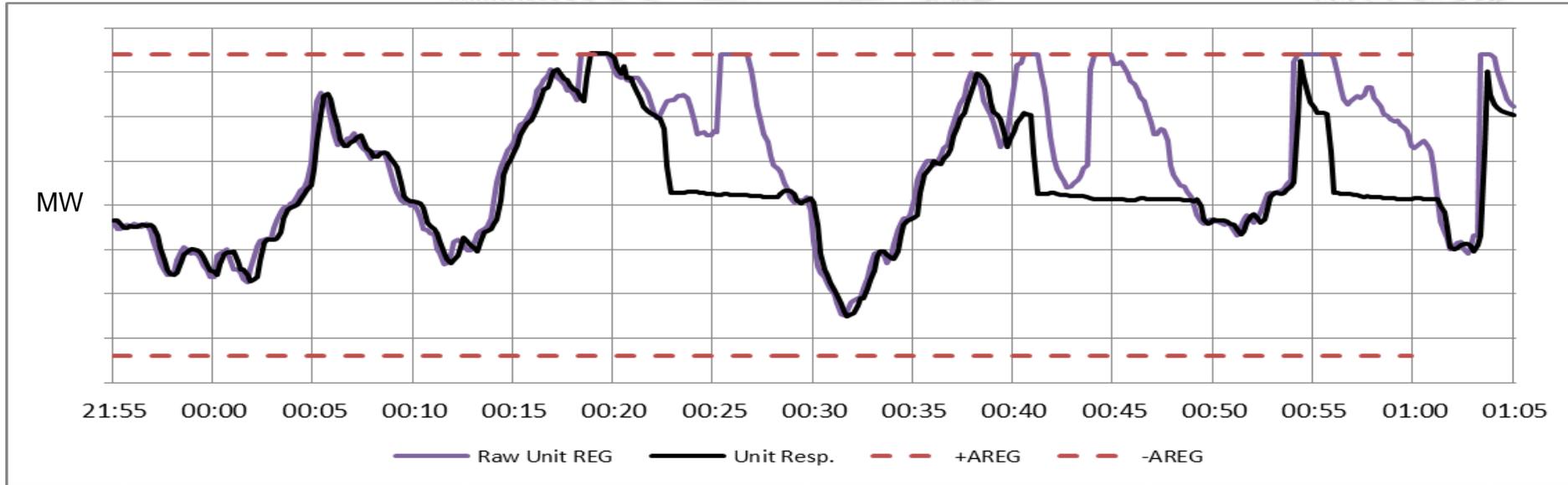




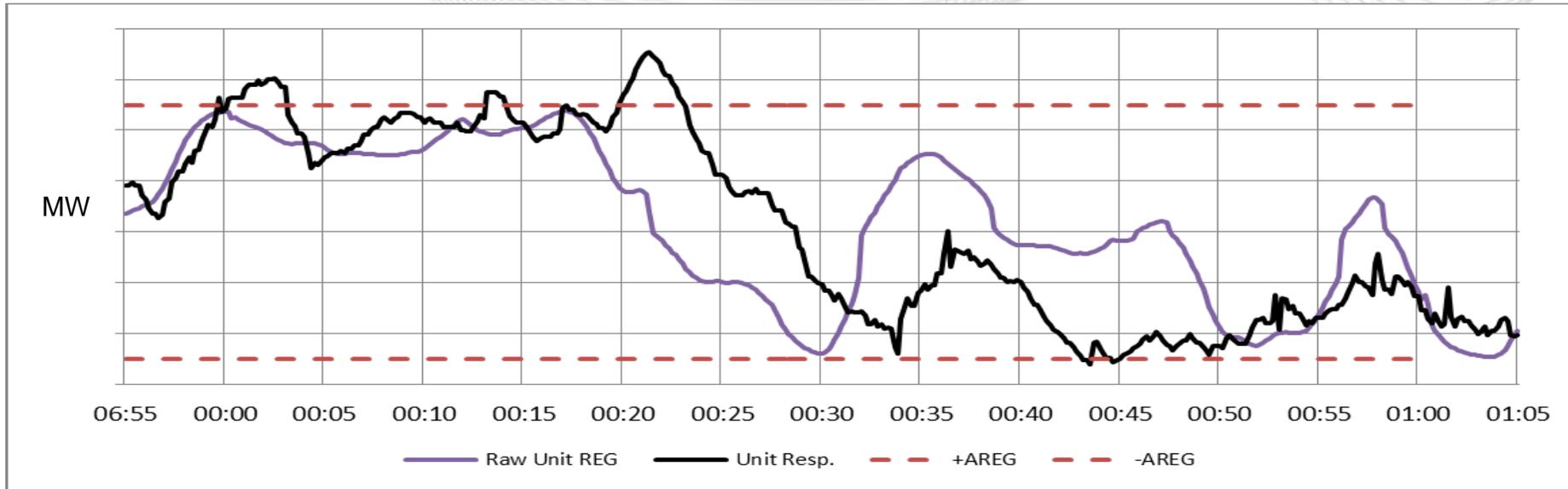
	Current	75% threshold	75% threshold, no precision
Performance (hourly)	0.899	0.755	0.706
Accuracy	0.901	0.688	0.688
Delay	0.945	0.727	0.727
Precision	0.851	0.851	0.702



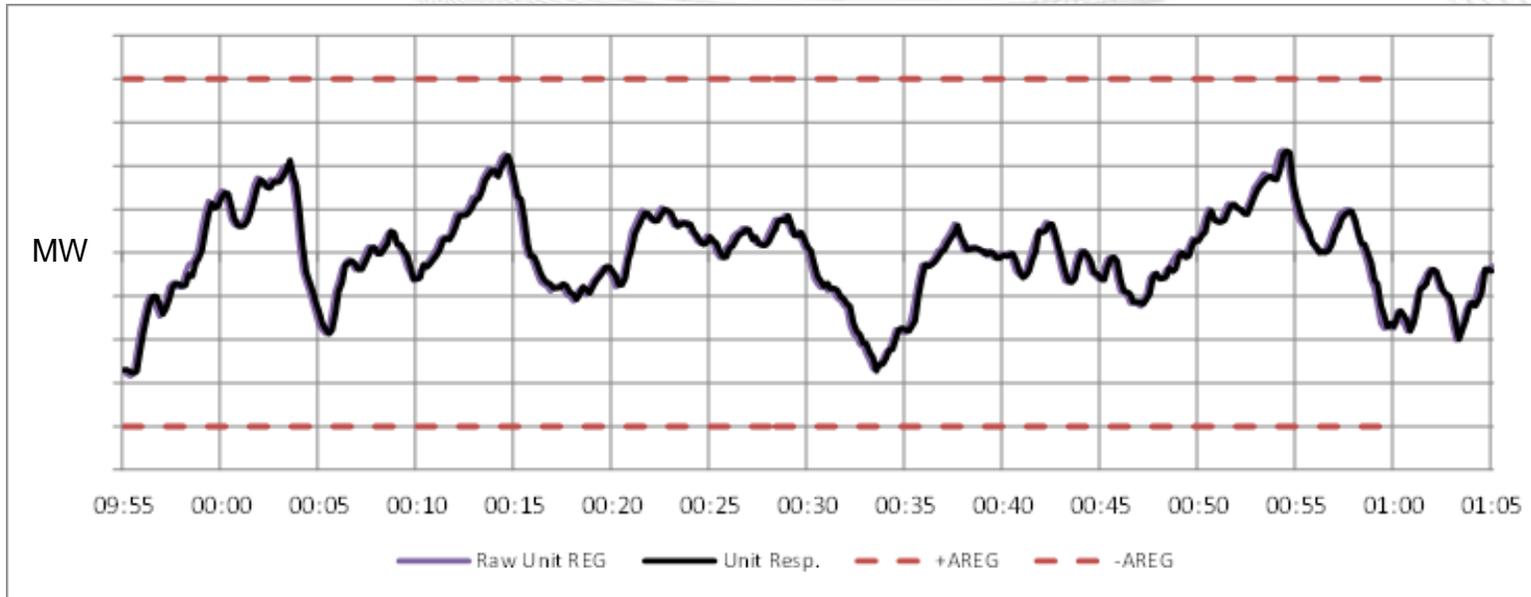
	Current	75% threshold	75% threshold, no precision
Performance	0.291	0.117	0.074
Accuracy	0.264	0.052	0.052
Delay	0.385	0.073	0.073
Precision	0.225	0.225	0.098



	Current	75% threshold	75% threshold, no precision
Performance	0.792	0.620	0.602
Accuracy	0.794	0.557	0.557
Delay	0.909	0.630	0.630
Precision	0.671	0.671	0.617



	Current	75% threshold	75% threshold, no precision
Performance	0.626	0.221	0.169
Accuracy	0.748	0.166	0.166
Delay	0.786	0.154	0.154
Precision	0.344	0.344	0.188



	Current	75% threshold	75% threshold, no precision
Performance	0.984	0.984	0.984
Accuracy	0.997	0.997	0.997
Delay	1.000	1.000	1.000
Precision	0.956	0.956	0.956

- Regulation Qualification Testing
 - Qualification testing requirements to stay status quo
 - 3 passing tests for new regulation resources (75%)
 - 1 passing test for ownership/signal path changes (75%)
 - 1 passing test for unit up-rates (75%)
 - Up-rate tests will be limited to once per quarter
 - Performance scoring of qualification test will be in line with new proposed calculation
 - Threshold check on precision
 - If precision score > 75%, score interval status quo ($1/3A + 1/3D + 1/3P$)
 - If precision score < 75%, score interval as precision only ($1/3*0 + 1/3* 0 + 1/3P$)

- Regulation Participation Threshold
 - Participation in regulation needs to be held to a higher standard than the current 40% threshold
 - Participation thresholds should be in line with the qualification threshold
 - 75% 100-hour rolling average score to participate in regulation market
 - Compensation threshold to stay status quo
 - Compensation received when hourly score > 25%