

**Helping our members work together
to keep the lights on...
today & in the future**



Priority Projects
Additional Benefit Metrics
January 5, 2010



Coal Plant Cycling Metric

- **Large coal units are operated between P_{\max} and P_{\min}**
- **Daily, weekly, or monthly average operating levels can be calculated**
- **Count cycles by determining number of times a unit's output crosses the average operating level**
- **Excessive cycling increases maintenance costs of units requiring capital investment**
- **New transmission that reduces this cycling results in a net benefit**



Assumptions

- **Base case has more wind than what is dispatched today**
- **Large coal units forced to cycle more**
- **Units have minimum and maximum outputs**



Proposed Process

- 1. Calculate cycling rates for base case and change cases**
 - a) Record hourly outputs for each unit under study
 - b) Calculate average output for each unit (baseline)
 - c) Calculate number of times hourly output crosses the baseline → 1 cycle
 - d) Calculate number of cycles that occur over (XXX) hour time period for each unit
- 2. If number of cycles is greater than “normal”, difference will be considered excessive**
- 3. Calculate delta cycle rates between base and change case for excessive cycling**



ESWG Decision Points

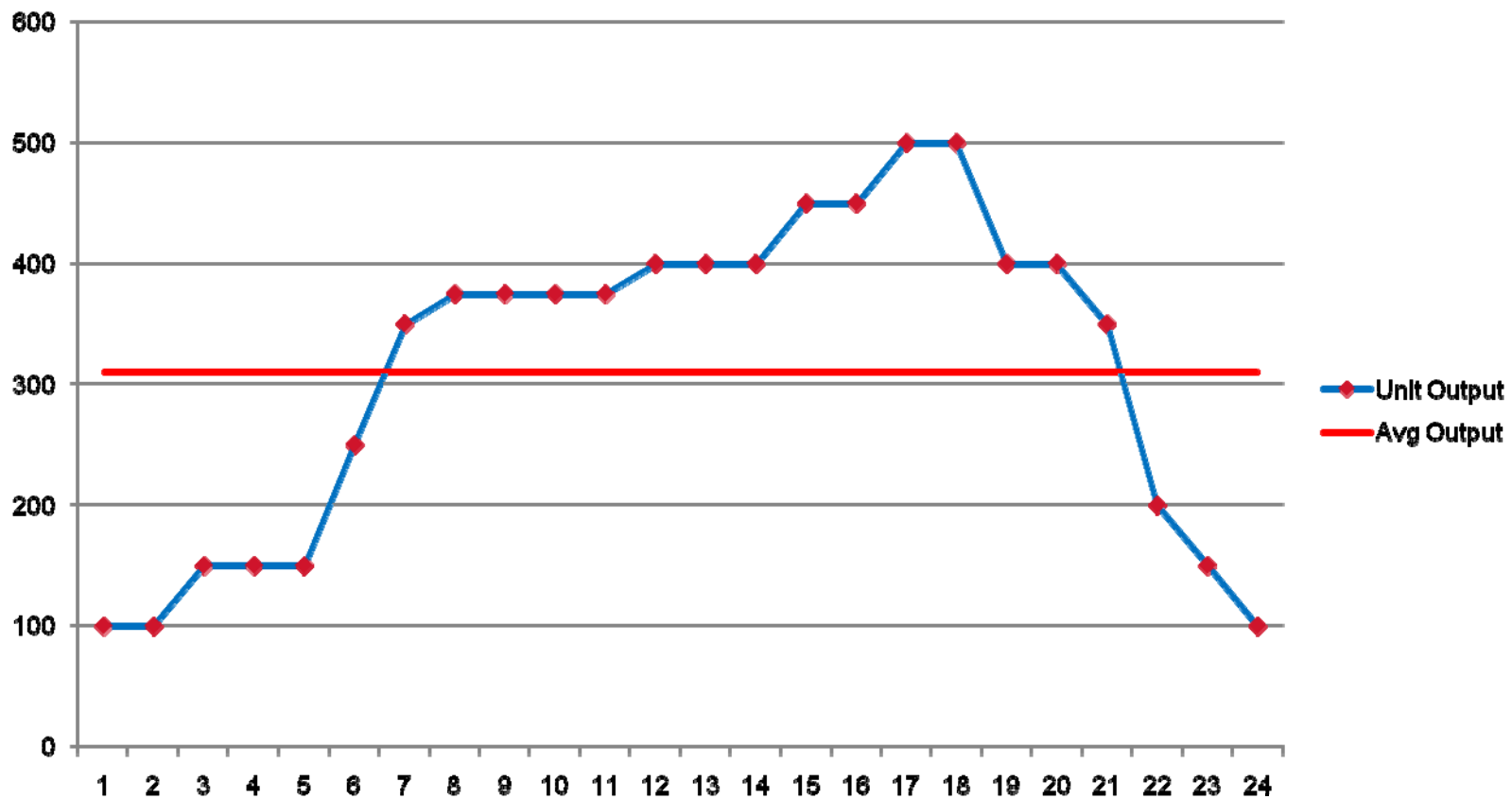
- 1. What is considered “normal” and “excess” cycling?**
 - ??
- 2. What is the dollar cost for “excess” cycling?**
 - \$5,000 to \$25,000 per cycle
- 3. What plants should this apply to?**
 - Coal units 350 MW and larger



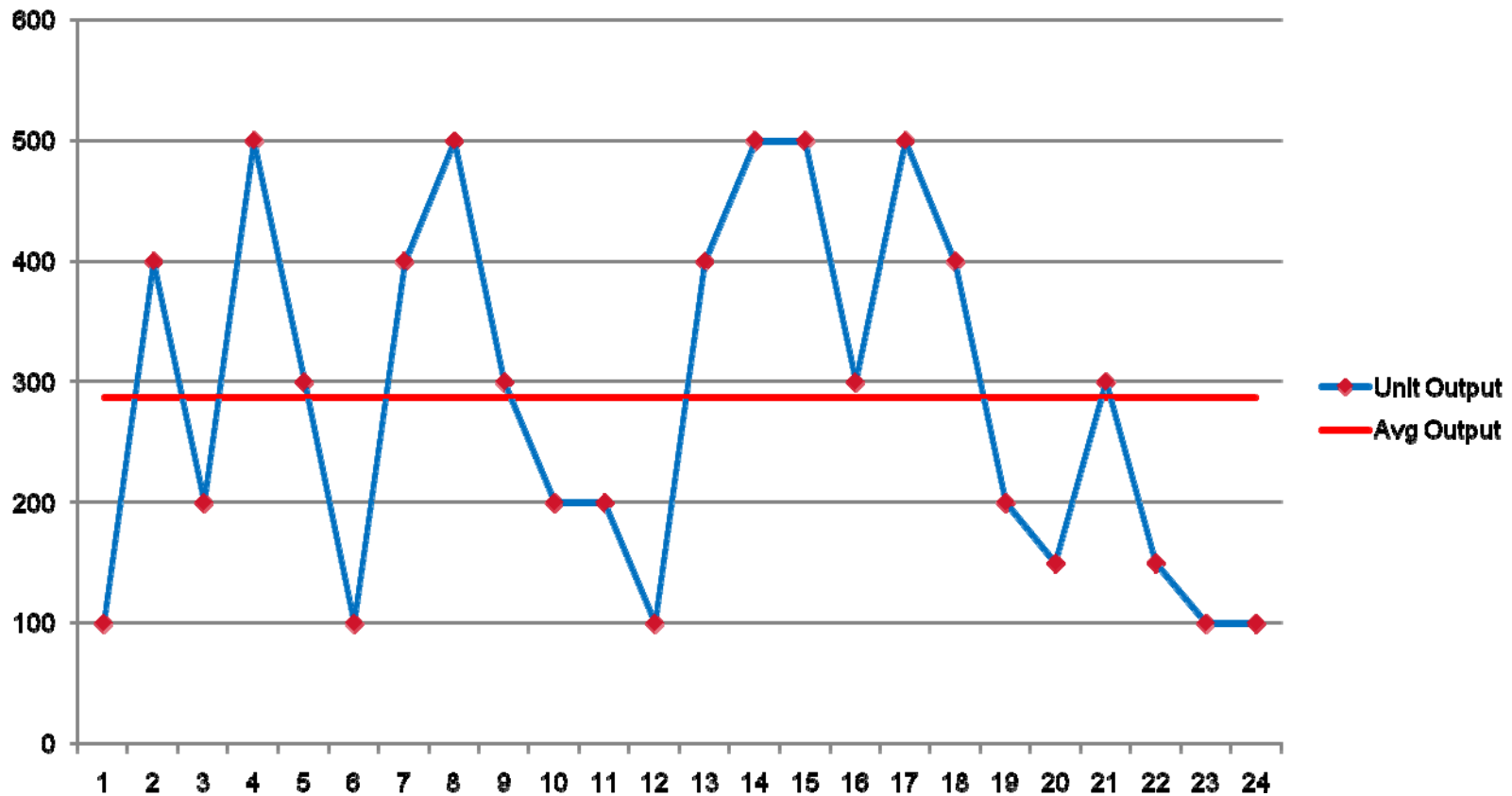
Other Discussion Items

- 1. Equivalent Forced Outage Rate (EFOR) increases for plants with excessive cycling**
- 2. Cold, warm, and hot startup rates for coal plants**
- 3. How to account for the magnitude of deviation from average**

“Normal” Cycling



“Excessive” Cycling Example #1



“Excessive” Cycling Example #2

