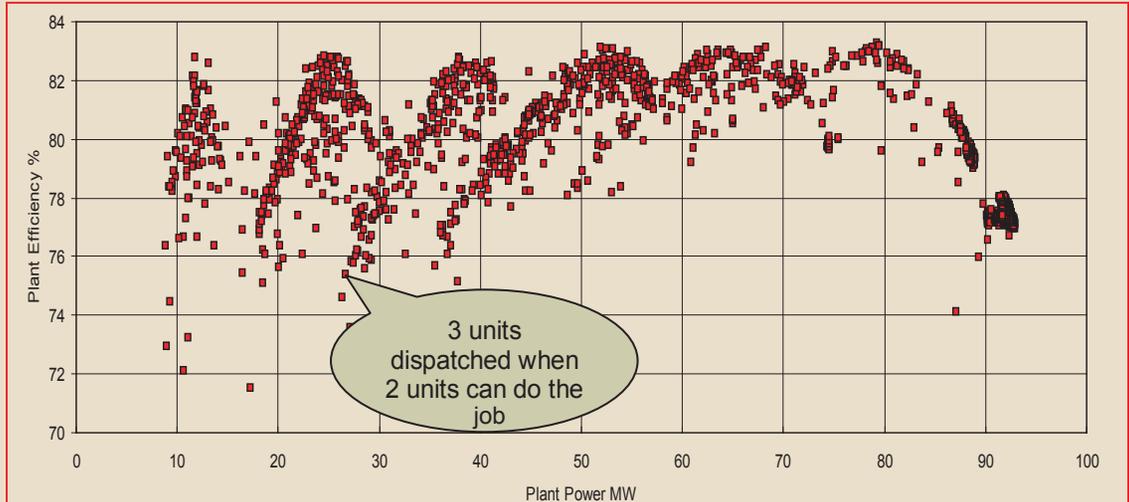


## POOR CHOICES ARE COSTLY

As an example, refer to the graph on the right of actual operating conditions graphed as a function of plant power. The graph illustrates the range in performance without using optimization. The graph indicates how choosing either the wrong combination or the wrong number of units result in plant performance variations of up to **10%**.



The choice of the number of units and the set point of each unit is vital to optimizing power plant production and minimizing discharge. A detailed analysis of this plant indicates that an annual performance improvement of 1 ½% is possible. The HydroAssistant can be used to output the recommended number of units and each set point to achieve this objective.

To illustrate the cost benefit ratio, consider this same plant and assume that the total cost to implement the HydroAssistant is \$75,000. This includes plant and personnel costs, purchase of software, services etc. These numbers can be used to obtain the expected gain in power production and the revenue increase from the utility by choosing their units wisely.

<b>Average Annual Generation for 2000-2005</b>	<b>350,374</b>	<b>MW-HRS</b>
<b>Expected Annual Improvement</b>	<b>1.5</b>	<b>%</b>
<b>Annual Energy Gain</b>	<b>5256</b>	<b>MW-HRS</b>
<b>Marginal Cost of Energy</b>	<b>20</b>	<b>\$/MWH</b>
<b>Savings</b>	<b>105112</b>	<b>\$</b>

Data	Description
8%	Annual discount rate. This might represent the rate of inflation or the interest rate of a competing capital improvement.
\$ (75,000)	Initial cost of investment
\$105,112	Return from first year
\$105,112	Return from second year
\$105,112	Return from third year
\$105,112	Return from fourth year
\$105,112	Return from fifth year
\$344,683	Net Present Value of Investment
<b>Return on Investment (ROI)</b>	
\$ 30,112	ROI first year
\$135,225	ROI second year
\$240,337	ROI third year
\$345,449	ROI fourth year
\$450,562	ROI fifth year

In the example to the left, the average production of the plant was calculated and a 1 ½ percent improvement is assumed based on the above.

*This is just one example of a 100 MW power Plant.*