



## Oxamine<sup>®</sup> technology used to reduce the back pressure in a power plant in the USA

### Background

A 1550-megawatt utility was experiencing reduced cooling efficiency during summer operation due to microbiological fouling of their condensers. The reduction in efficiency required offline cleaning of condensers.

Microbiological buildup and fouling of the condenser was resulting in significant back pressure issues. Each unit had to be taken offline and condenser boxes cleaned during 2010 operation due to fouling issues. Back pressure was as high as 5" Hg at times.

Due to the performance issues with bleach and sodium bromide, the plant decided to evaluate Oxamine technology to attempt to address summer operating issues.

The plant used a bromide application limited to 2 hours/unit/day which turned out to be insufficient to provide good microbiological control for standard bleach and sodium bromide treatment (fed at a 6:1 ratio).

### Action

To meet the objective to improve microbiological control which is causing loss of generating capacity and offline cleaning during peak summer operating conditions, the plant was limited to 2 hours of chlorine feed per day with a total discharge chlorine limit of 0.2 ppm.

Buckman initiated Oxamine 6150 daily for 2 hours to each unit. Total chlorine levels at the condenser averaged between 0.35–0.55 ppm and bisulfite was fed at the condenser outlet to meet total chlorine discharge permit limits of 0.2 ppm. Oxamine was fed to the pump suction of the circulating pumps. Total chlorine and ATP was monitored at the condenser to evaluate program performance.

The success of the program would be indicated by a reduction in condenser back pressure as compared with 2009 and 2010 results and the elimination of the need to shut down during the summer to clean condensers due to biofouling.

### Results

Microbiological dip slides indicated an effective kill during treatment with Oxamine. ATP data initially showed a significant increase in free (expired) ATP levels during the treatment program, which also indicates effective killing. After three weeks of Oxamine treatment there was no visible increase in the ATP levels. This is an indication that the system was cleaned up.

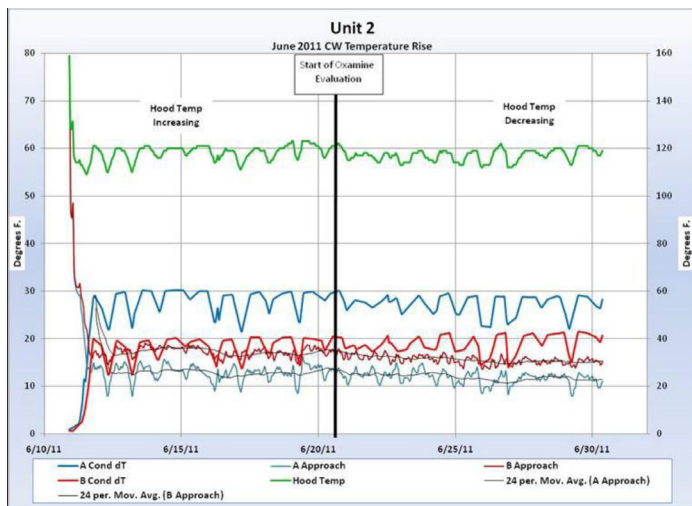


After the first week of the evaluation, the plant made the decision to initiate Oxamine on Unit #1 in the hopes that they could obtain similar benefits. Unit #1 results mirrored Unit #2 results.

### Benefits

The good overall microbiological results coincided with improvements in condenser performance. Condenser approach temperatures began to decrease from the start of Oxamine treatment (lower 2 trend lines in previous graph) indicating that the system was cleaning up.

*Continued on back.*



## ROI

Chlorine usage was reduced from 400 gpd to 150 gpd using Oxamine® technology.

Continuous Improvement Items	Savings
Eliminated Condenser Downtime for Cleaning	\$450,000
Eliminated Condenser Cleaning Costs	\$85,000
0.5" Hg backpressure improvement (Unit #1)	\$450,000
0.5" Hg backpressure improvement (Unit #2)	\$393,750
<b>Total Savings</b>	<b>\$1,378,750/year</b>

Total savings were calculated using back pressure savings of only 45 operating days/yr (June – mid-July prior to condenser cleaning). Additional savings may be achieved as back pressures typically increase following condenser cleanings each summer.

## ROE

The amount of chlorine was reduced significantly, thus reducing the chemical loading on the effluent system. This also reduces risk to the plant personnel as a result of the reduction in chemical handling in the plant.

## Conclusion

To date the customer is extremely satisfied with the results obtained with Oxamine.

Seller warrants that this product conforms to its chemical description and is reasonably fit for the purpose referred to in the directions for use when used in accordance with the directions under normal conditions. Buyer assumes the risk of any use contrary to such directions. Seller makes no other warranty or representation of any kind, express or implied, concerning the product, including **NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS OF THE GOODS FOR ANY OTHER PARTICULAR PURPOSE**. No such warranties shall be implied by law and no agent of seller is authorized to alter this warranty in any way except in writing with a specific reference to this warranty. The exclusive remedy against seller shall be a claim for damages not to exceed the purchase price of the product, without regard to whether such a claim is based upon breach of warranty or tort. W936W (11/24)