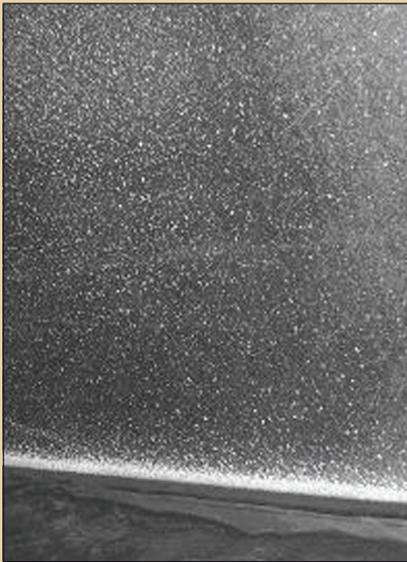


# Food Processing Plant Uses 3D TRASAR® Technology to Control Cooling Costs and White Rust Problem



**Figure 1** – Evidence of white rust corrosion — thick, white, waxy deposits — appeared shortly after installation of the new cooling towers in November 2003.

## Annualized Environmental ROI (eROI<sup>SM</sup>)

 water	5 million gallons in reduced cooling water sewer costs	\$10,000/yr in reduced cooling water sewer costs
 asset protection	Longer expected evaporative condenser life	\$25,000/yr longer expected evaporative condenser life

The stresses placed on industrial cooling systems are different in every facility. At one western food processing plant, make-up water hardness was so low, alkalinity so high and variation in water chemistry so frequent that white rust — corrosion of galvanized steel — resulted in capital cost expenditures of \$750,000 to replace failed cooling towers.

### White Rust

White rust causes premature failure of galvanized steel components. A white gelatinous or waxy deposit often identifies white rust corrosion. This deposit, a zinc-rich oxide, is porous and generally non-protective. High alkalinity, high pH and low hardness cause the problem.<sup>1</sup> All of these conditions existed at this facility and were aggravated by variations in water chemistry that made control problematic.

The cooling system make-up water contained 4-6 ppm of calcium hardness, necessitating high-cycle operation to obtain the minimum 50 ppm calcium hardness recommended by the Cooling Tower Institute (CTI) to prevent white rust. Acid feed was also required to bring the alkalinity within CTI guidelines.

### 3D TRASAR Relieves Stress

The new evaporative condensers were installed in November 2003, and a very small amount of white rust became apparent upon inspection months later. (Figure 1) Concerned that this condition would result in further damage to the cooling towers, the plant engineering staff looked to Nalco for a solution. Nalco 3D TRASAR system provided the answer in January 2004.

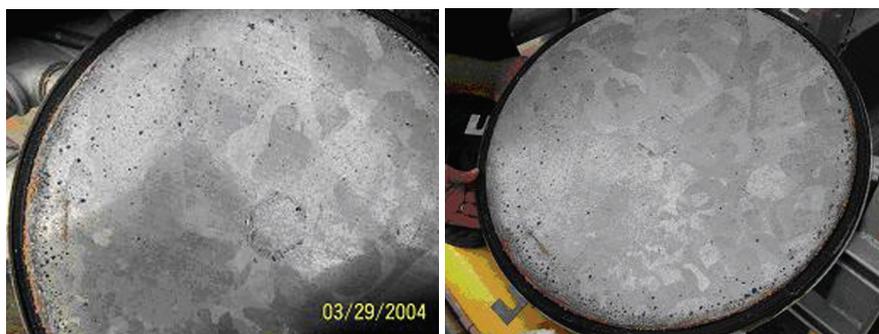
*(Continued on Reverse Side)*

<sup>1</sup>WHITE RUST: An Industry Update and Guide Paper 2002 Association of Water Technologies

3D TRASAR technology measures the key parameters related to system stress. When upsets occur, 3D TRASAR technology takes timely, appropriate, corrective action. It then communicates with system users, informing them of what happened, when, and what actions were taken to compensate.

High cycle operation required acid feed in order to reduce alkalinity. If the acid feed system failed, the tower pH would rise. At high pH, conditions would be right for white rust formation. Timely attention to any failure of the acid feed system was critical to preventing this operational problem. 3D TRASAR technology provided alarm notification via cell phone, text message, e-mail or digital pager, ensuring the right people knew about any problem immediately and could take corrective action.

Weekly inspections are conducted on the cooling towers. As shown in Figure 2, results since installation of 3D TRASAR technology have been excellent.



**Figure 2** – The photo on the left shows the condenser door two months after installation of 3D TRASAR. The photo on the right shows the same door four months after 3D TRASAR installation. No evidence of continued white rust formation can be seen.

## Results

By initiating a Nalco 3D TRASAR cooling water automation program to better control the system water chemistry, white rust has been abated and an expected \$45,000 per year in cost savings is being realized. An important key to the success of this program is the alarm notification feature of the automation equipment. It contacts Nalco via cell phone and communicates specific problems so that immediate response can occur. This has helped keep the program in compliance more than 99 percent of the time.

No scale or other mild steel corrosion problems have been seen and cost savings have come from:

- Longer expected evaporative condenser life (\$25,000/year)
- Reduced cooling water sewer costs (\$10,000/year)
- Reduced treatment chemical costs (8,000/year)
- Labor savings from reduced water testing (\$2,500/year)

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