

# 60 Million Gallons of Water Saved

## 3D TRASAR™ Technology for Cooling Water helps Nucor Steel with wastewater discharge issue

**NALCO**  
An Ecolab Company

CASE STUDY - PRIMARY METALS

CH-1033

### BACKGROUND

Nucor Steel Kankakee, Inc. in Bourbonnais, Illinois was facing issues with respect to water balance. As part of their initiative to reduce water usage, they recycle all of the blowdown from the four non-contact cooling water systems to the main process water system which supplies cooling water for the continuous caster and rolling mill. Because the non-contact cooling water cycles were not optimized, excessive blowdown was entering the process water system leading to water balance issues. Nalco collaborated with Nucor to implement 3D TRASAR technology to solve the mill's water balance challenges while meeting water conservation targets.

### SITUATION

Nalco Company completed a plant water balance audit to understand the dynamics of the water systems. The audit showed that improvements

could be made in fresh water makeup use in several plant cooling systems. It was found that poor control of the make-up and blowdown valves was leading to excess fresh water make up use. This was a significant contributor to the water imbalance in the plant. Using less fresh water as makeup for cooling systems would mean less water discharged to the process water system.

In addition, the existing treatment program had increased the stresses on the cooling towers:

- Poor cycle control was creating uncontrolled water losses
- Poor chemical treatment control was causing corrosion
- Iron deposition was apparent throughout the reheat furnace tower system
- Corrosion data was not being collected

#### CUSTOMER IMPACT

Water savings of 60 million gallons of water annually

eROI™



#### ECONOMIC RESULTS

Annual savings of \$125,000

*eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.*

- There was no direct chemical control or monitoring of the mold water

## PROGRAM

The Nalco Cooling Water Optimizer was used to demonstrate the capability to run higher cycles. 3D TRASAR technology for cooling water was installed on four open, recirculating cooling systems (Figure 1) as part of the Nalco program. Innovative Nalco chemistry and wireless gateways connected to Nalco 360 Service completed the package.

3D TRASAR technology detects changes in water chemistry and determines corrective actions necessary to maintain optimal conditions in each cooling tower. Nalco 360™ Service provides continuous monitoring of data and alarms by Nalco cooling water experts.

Additional Actions Taken:

- Installed side-stream water softener due to hardness spikes
- Installed corrosion coupon rack to provide more detailed corrosion monitoring capability

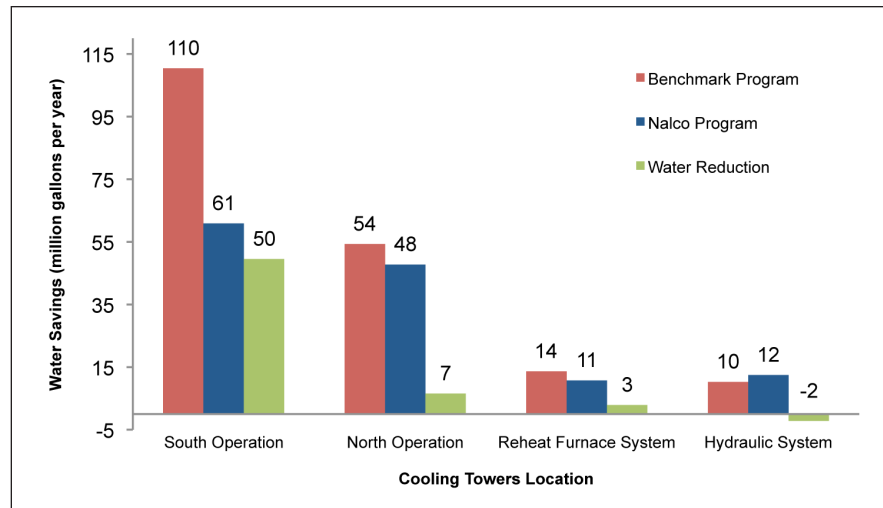


Figure 1 - Water Savings from Nalco Cooling Water Program

- Alternate biocide additions weekly for good bacteria control

Nalco capabilities combine to deliver both environmental performance and higher profits to our customers. To communicate our successes, Nalco uses a measurement system called eROI, environmental return on investment that describes how we have helped our Customers improve their environmental footprint (water, energy, air, waste, assets) and bottom line.

## ENVIRONMENTAL RESULTS

Nucor Steel Kankakee, Inc. was able to provide stability to their water balance issues while reaching their water conservation goals. Across the four cooling systems, make up water (fresh city water) usage was reduced by 60 million gallons annually. Water consumption per ton of steel produced was reduced by nearly 30 percent.

## ECONOMIC RESULTS

The water savings documented in this case are valued in excess of \$125,000 per year. Based on the cost of the Nalco program, economic payback will be achieved by Nucor Steel Kankakee, Inc. in 1.5 years.

## Nalco, an Ecolab Company

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