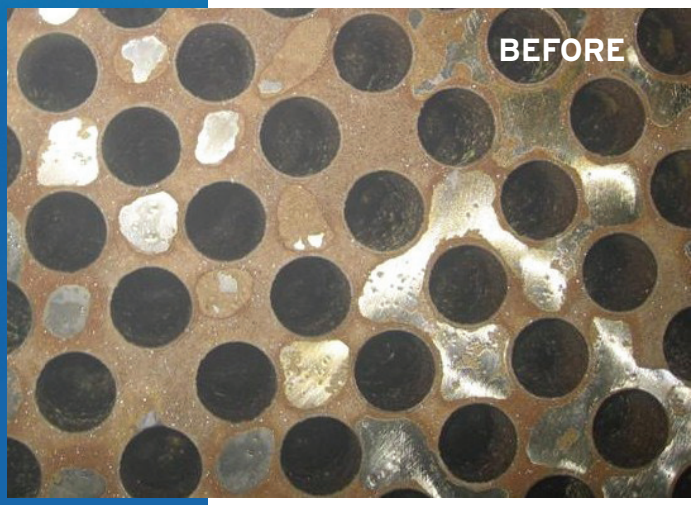
NALCO Water's Program Integral to Midwestern Ethanol Plant's Achievement of 10% Increase in Production

NALCO Water
An Ecolab Company

CASE STUDY – FOOD & BEVERAGE

CH-737



SITUATION

A dry grind ethanol plant in the Midwestern U.S. experienced frequent cleanings of stillage evaporators due to organic and inorganic foulants/deposits. The build up of these foulants/deposits required that the set of evaporators be cleaned every 3 weeks with a dilute caustic solution. Evaporators were out of service for 4-6 hours during the cleaning process. While the plant had good tank level management in place, the rapid fouling of stillage evaporators lead to erratic backset rates, which effected fermentation conditioning and performance.

PROGRAM

NALCO Water followed their scientific approach to deposit control (see Figure 1) in order to fully understand the plant's process before making a recommendation.

Laboratory analysis of the foulants/deposits determined that they were 87% organic and 12% inorganic (calcium oxalate). Based on this analysis, NALCO Water believed that

(Continued on Reverse Side)

NALCO WATER'S APPROACH TO DEPOSIT CONTROL

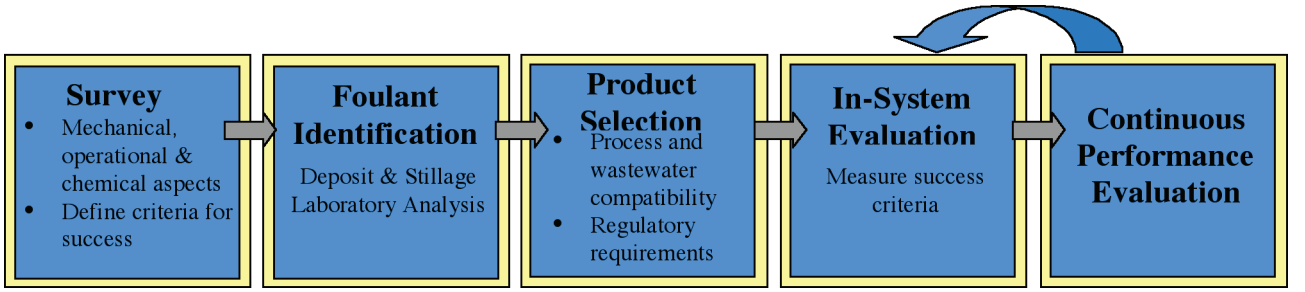


Figure 1 – *NALCO Water's Scientific Approach to Deposit Control*

inorganic deposits were serving as nucleation sites on the equipment surface accelerating organic deposition, and recommended NALCO Water 8975. This product is FDA approved as a scale inhibitor when resulting product may be employed as animal feed.

RESULTS

NALCO Water 8975 was applied to thin stillage going to the evaporator system. Within the first three weeks, operational measures showed evaporator fouling was inhibited. Results to date show that cleaning frequency has been reduced from every three weeks to over 5 months.

RETURN ON INVESTMENT

Before implementation of NALCO Water's deposit control program, the plant was cleaning evaporators every three weeks with a dilute caustic solution and hydroblasting evaporators 4 times a year. By inhibiting evaporator fouling, the plant has reduced cleanings to every 5-6 months and expects to reduce hydroblasting evaporators to yearly. Reduced hydroblasting will result in a savings of $25,000 - $30,000/yr. Deposit control has also allowed for steady state operation around the evaporators, which in turn allows for consistent backset rates. This consistency was one part of a multistep program to optimize cook/fermentation conditioning. The plant has increased ethanol production by 7-12% since NALCO Water 8975 implementation.

NALCO Water, an Ecolab Company

North America: 1601 West Diehl Road • Naperville, Illinois 60563 • USA
Europe: Richtistrasse 7 • 8304 Wallisellen • Switzerland
Asia Pacific: 2 International Business Park • #02-20 The Strategy Tower 2 • Singapore 609930
Latin America: Av. das Nações Unidas 17.891 • 6º andar • São Paulo • SP • Brazil • CEP 04795-100

nalco.ecolab.com

NALCO Water
An Ecolab Company