

## BEST PRACTICES: THE ENGINEERING APPROACH FOR INDUSTRIAL BOILERS

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*Presented at the Twenty-Third National Industrial Energy Technology Conference, Houston, Texas, May 1-4, 2001*

### ABSTRACT

A plant's boilers represent a large capital investment, as well as a crucial portion of overall plant operations, regardless of the industry our customers are in. It is important to have systems and procedures in place to protect this investment, as well as plant profitability. Boiler Best Practices represent The Engineering Approach for Boilers—a way to examine mechanical, operational and chemical aspects of the systems (pretreatment through condensate) to ensure reliable boiler operations with no surprises.

### INTRODUCTION

All industrial plants have boilers of one type or another, often more than one type. Whether the plant in question has one small boiler, or many large ones, the boilers are an essential element of every plant, regardless of plant size or of product produced. With skyrocketing fuel and energy costs, maintaining both boiler reliability and consistent system performance while minimizing energy costs can be a challenge and an opportunity for any utility operation. The Engineering Approach provides a framework to examine all aspects of Boiler Best Practices to optimize system performance, and Total Cost of Operations.

Implementing the Engineering Approach assists in gathering information to measure and track progress, to initiate further improvements, and to allow benchmarking and norming of systems across corporations, within industries, and so forth.

There are several steps in the effective implementation of the Engineering Approach, or Best Practices for Boilers. This paper will discuss the philosophy of the Engineering Approach, as well as examples of its implementation, and the benefits received from it both in terms of system operation, and in terms of Total Cost of Operations.

### WHAT IS THE ENGINEERING APPROACH?

The Engineering Approach represents the formalization of ONDEO Nalco's approach to serving our customers. It is fundamentally a customer-centric method of doing business that permits the management of knowledge of the customer's water system, and knowledge of the impact that water systems can have on process operations,

environmental performance, and overall costs. This engineering knowledge is used to significantly build value for the customer.

The fundamental elements of the Engineering Approach are Mechanical (M), Operational (O) and Chemical (C) considerations. This provides a system that

- is independent of personnel movement to new assignments (customer or consultant)
- focuses on results
- is proactive in the prevention of problems
- identifies opportunities to reduce total cost of operation (TCO) for the plant

The Engineering Approach represents best practices for boilers in that it provides a benchmark for continuous improvement of our customers' systems. With the Engineering Approach we provide recommendations for optimizing Total Cost of Operations (TOC) by considering all relevant factors.

### WHY IMPLEMENT THE ENGINEERING APPROACH?

Individual plant management is increasingly being asked by their corporate offices to consider financial results, TCO, quality, environmental health and safety, and manpower effectiveness. The order of importance may have changed over the past few years, and may be different from industry to industry, but all plants are focussing more and more on the environment, safety, budgets, and performance.

Water treatment can have an impact on all areas of a utility budget. Actual water treatment costs, however, usually only represent 2-3% of overall costs, as seen in Figure 1. Although water treatment chemicals represent a small portion of the utility budget, they have a major impact on all areas of a utility budget. Water touches most if not all of the key process units, and can have a major impact on production rates, maintenance costs, and overall plant profitability.

Unexpected boiler outages will limit, or even stop, production. Poorly run boiler systems will be very energy inefficient, and may even result in environmental problems with emissions.







