

## IMPROVING RDF COMBUSTION: CASE HISTORIES

**Peter Z. Kubin**

Technology Department  
Ogden Projects, Inc.  
Fairfield, New Jersey

### ABSTRACT

During the past ten years Ogden has acquired or took over operating of several waste-to-energy facilities using RDF technology. Based on our diversified design, construction, and operating experience, Ogden conducted a multifaceted program to understand and improve the general plant operation and in particular the combustion in these RDF plants. This program has resulted in improved combustion stability, reduced corrosion/erosion of boiler components, and lower air pollutant emission rates.

The program began with a detailed evaluation of furnace design parameters and historical operating and maintenance data. This evaluation identified specific areas of concern at each plant, such as equipment with high maintenance requirements, low reliability, or high operating costs. Design parameters at the various facilities were compared to each other and to Ogden's mass-burn plants to gain insight into combustion issues such as fuel feed, combustion air supply, flame stability, and boiler corrosion.

This was followed by detailed studies of the combustion process in the plants, including furnace air flow modeling and corrosion and erosion processes in the boilers. This generated an understanding of many of the processes taking place in the furnace, and suggested opportunities for improvement.

The knowledge gained was used to determine appropriate improvements for each facility, in the form of equipment modifications and changes to operating and maintenance procedures. Finally, field testing was conducted after all modifications had been made to evaluate performance at each facility. Minor adjustments and fine-tuning were performed to optimize operations.

The RDF facilities are now operating at higher reliability and efficiency, with lower air emissions and improved

combustion stability. These facilities are now fully integrated into Ogden's waste-to-energy operations with their own optimized preventive maintenance programs and improved training.

### INTRODUCTION

This two-case presentation includes the RDF facilities in Lawrence, Massachusetts and Honolulu, Hawaii. There are interesting differences between these two projects, including the fact that Lawrence is among of the older RDF plants, and the two utilize somewhat different technologies and boiler design. However, both have suffered from considerable corrosion of the furnace and superheater tubes and heavy fouling in the convection tube sections.

### CASE ONE: LAWRENCE

In 1986, Ogden acquired the RDF facility from the original developer and operator, Refuse Fuels, Inc. (RFI). During the initial two years of operation, from 1984 to 1986, the facility encountered numerous operating difficulties. Technical problems included malfunctions and breakdowns of the front-end processing equipment used to make the shredded fuel; low operating availability due to boiler corrosion, erosion and fouling; and major air emission problems that caused the facility to exceed its permissible limits. These technical failings kept the facility from meeting its economic goals.

### Description

The Haverhill/Lawrence RDF facility is designed to handle 1300 tons-per-day (TPD) of refuse. The front-end RDF preparation plant is located in Haverhill, Massachusetts and the combustion and power generation plant is located in Lawrence, Massachusetts.