Proceedings of the 17th Biennial Waste Processing Conference
ASME 1996

CAMDEN RESOURCE RECOVERY FACILITY

ENHANCING ENVIRONMENTAL PERFORMANCE with an EMPHASIS ON RECYCLING

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ABSTRACT

The Camden Resource Recovery Facility is part of a planned solid waste management program developed by Camden County, located in southern New Jersey across the Delaware River from Philadelphia. This mass-burn plant, which began operating in March 1991, processes waste from 37 towns in the County. It is capable of burning 1050 tons per day (tpd) of refuse to generate electricity, which is sold to Jersey Central Power & Light Company. The plant is located in an industrial area of Camden and is also designed to produce high-pressure, high temperature steam to provide sufficient energy for any existing or future industrial customers.

The facility, shown in "Fig. 1", was designed and built by Foster Wheeler and is owned and operated by Camden County Energy Recovery Associates, L. P., a subsidiary of Foster Wheeler Power Systems, Inc. The Pollution Control Financing Authority of Camden County is responsible for project oversight and administration for the County. The Authority is also responsible for operating the County landfill. Camden County's comprehensive waste management system, which will be described below, has indeed been successful for its more than 500,000 residents.

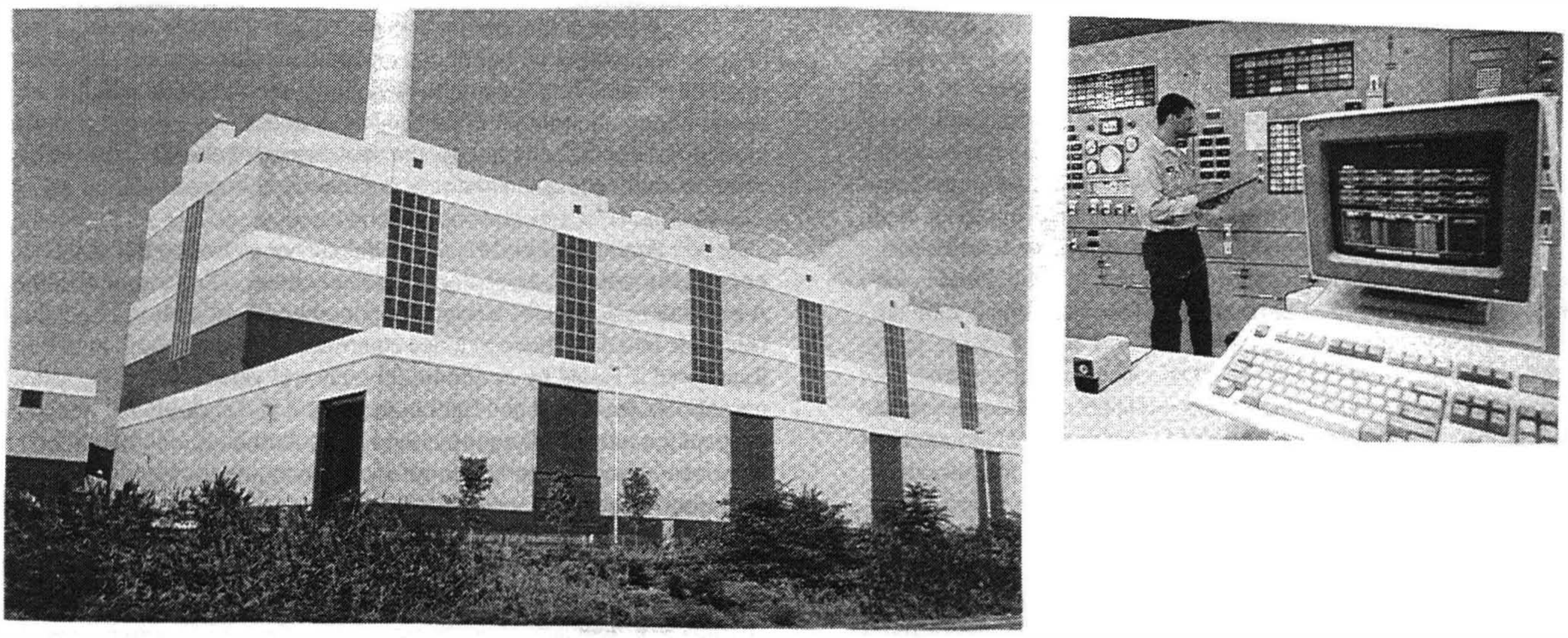

Figure 1. High visibility made esthetics an important part of the plant design (above left). In operation, real-time data from a continuous emissions monitor (above right) is telemetered to the state regulatory agency for compliance assurance.

In looking towards the future and the recently promulgated Emission Guidelines under the Clean Air Act, which will affect all municipal waste incinerators and result in reducing overall air emissions, a number of extensive Test Programs aimed at enhancing overall environmental performance were undertaken. These programs entailed testing of Activated Carbon Injection, proper Burning of Whole Tires, Reclaimed Baled Waste and Enhanced Shredder Derived Fuel, and Recycling of the Facility's Combined Ash Residue for use as Landfill Cover. All Test Programs, and more importantly their test results, were successful in demonstrating enhanced environmental performance with an emphasis on recycling.

INTRODUCTION

Representing the state-of-the-art combustion technology for a system deriving energy from municipal solid waste (MSW), the 1050-ton/day refuse-to-energy plant serving Camden County, NJ, achieved commercial operation on July 1, 1991.

A noteworthy aspect of the project is that it was the first County-wide plan in the US to combine waste-to-energy with recycling. The recycling effort included one of the country's first materials-recovery facilities. Commissioned early in 1986 - well in advance of a state law mandating recycling - it provided a model emulated by other communities. Today Camden County recycles approximately 43% of its wastes. The facility has recently completed its fourth full year of operation while processing on an average annual basis 380,000 Tons of MSW. Overall plant capacity has averaged 95% with over 775,000 megawatt hours of electricity having been exported. Emissions are continuously monitored with results displayed both in the plant and at the New Jersey Department of Environmental Protection. Actual air emissions have been substantially below the permitted limits and will be further reduced now that the installation of an Activated Carbon Injection System has been completed. Also, ferrous material is being recovered from the ash residue with facility improvements in progress to recover additional ferrous material.

Prior to discussing the various test programs and environmental enhancements, a detailed facility description is provided.

FACILITY DESCRIPTION

Mass burning involves little or no presorting of refuse. With the exception of large noncombustible objects that may be found in the incoming waste stream, the as-received refuse is charged into the furnace.

The Plant shown in "Fig. 2" has three boiler trains, each sized for 350 tons/day of 5300 BTU/lb. fuel and is designed to accommodate a fourth train. At the maximum continuous rating, each boiler generates 105,000 lb/hr of steam at 650 psig/750F, and exports in excess of 25 MWH/hr. at 26 KV during peak demand periods.

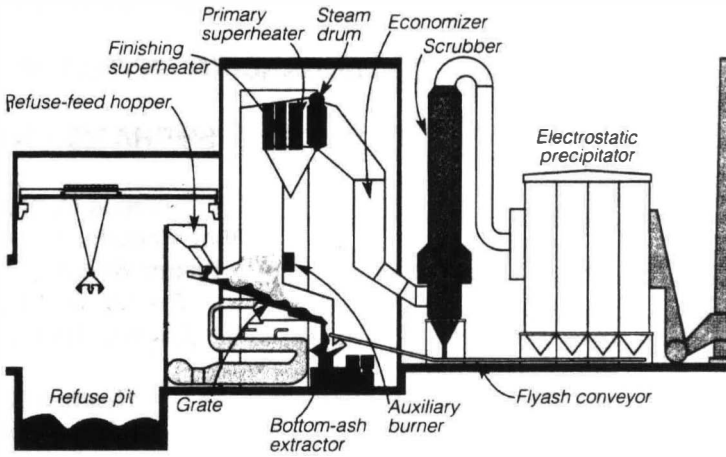

Figure 2. Resource Recovery Plant at Camden, NJ handles 1050 Tons/day of municipal waste.

The plant accepts more than 200 refuse trucks daily, which (after weighing) enter a tipping building and unload into an open storage pit. The pit is sized for four days of storage to provide the necessary capacity reserve for weekends and holidays. The tipping building houses the refuse pit for weather protection and controls fugitive dust and odors. Ventilation is provided by drawing combustion air through the building enclosure into the boilers and is used as combustion air to burn the refuse.

The tipping building also houses the two cranes that mix and load refuse into the boilers. The constant mixing is important - it ultimately results in a more homogeneous fuel for the boilers, which promotes improved furnace operation and minimizes load swings caused by variations in refuse heating value. The crane operator is responsible for the removal of oversize and undesirable material that could cause problems in either the feed chute or ash removal system. The rejected material is removed from the pit for separate disposal.

Refuse is dropped from the crane grapples into separate feed hoppers supplying each boiler. To maintain a furnace air seal, the crane operator ensures that the refuse-feed chute into the boiler is full at all times. Should the level in the feed chute drop below a prescribed level, an alarm is sounded. Typically, the crane operator charges each boiler about every five to six minutes to maintain a full chute.

Firing equipment. Once the crane has loaded the charging hopper, the material drops down the feed chute and onto a feed table. A series of hydraulically driven charging rams push material from the feed table into the furnace at a rate controlled by fuel or steam demand. Ram speed is varied by hydraulic flow-control valves. Charging rams may also be biased left and right to even out fuel distribution across the width of the furnace. For protection against burnback and radiant heat the entire charging throat area at the furnace interface is lined with refractory. A shutoff gate isolates the feed chute from the charging hopper.