Heat Recovery Dry Injection Scrubbers for Acid Gas Control

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Peter J. Finnis. P. Eng.
Procedair Industries Corp.,
12700 Shelbyville Road
Louisville, KY 40243
Ph: (502) 254-6130, Fax: (502) 254-6132

INTRODUCTION

Both the UK and US Municipal Waste Combuster (MWC) markets have undergone upgraded regulatory control. In the UK, the government's Integrated Pollution Control (IPC) regime, enforced by the 1990 Environmental Protection Act (EPA) Standard IPR5/3 moved control of emissions of MWCs from local councils to the government Environmental Authority (EA). Existing MWCs had until December 1, 1996 to complete environmental upgrades. Simultaneously, the European Community (EC) was finalizing more stringent legislation to take place in the year 2001.

In the US, the 1990 Clean Air Act amendments required the Environmental Protection Agency (EPA) to issue emission guidelines for new and existing facilities. Existing facilities are likely to have only until the end of 1999 to complete upgrades.

In the UK, retrofits had considerable incentive to maximize energy recovery because of government incentives for energy production from renewable resources. Four facilities with a total capacity of 900,000 tpy opted for energy recovery and air pollution control. Our company in the UK has received contracts, which included energy recovery equipment as part of Air Pollution Control (APC) contracts at:

1. Coventry and Solihull Waste Disposal Company(CSWDC), originally with a capacity of 175,000 tpy but upgraded to 260,000 tpy.
2. London Waste Company, Edmonton, with a capacity of 690,000 tpy.

Our UK company has also received a contract from Kvaerner EnviroPower AB for APC equipment for the Baldovie facility in Scotland with a capacity of 150,000 tpy. Kvaerner will be supplying the low outlet temperature economizer for this project. Just recently our Italian company received an order for Lomellina Energy in Parona . Procedair will be supplying the energy recovery economizer as part of the APC equipment for this 140,000 tpy facility.

In North America, our company had received contracts from Kvaerner EnviroPower AB, for APC systems on four new Refuse Derived Fuel (RDF) fluid bed boilers that incorporated low outlet temperature economizers as part of the original boiler equipment. The Fayetteville, North Carolina facility was designed for 200,000 tpy. Procedair has also received an order for two 50 tpd modular incinerators. While these do not incorporate heat recovery economizers, they will utilize heat exchangers to lower the temperature to about 285 ^{0}F.

What all these facilities have in common is low economizer outlet temperatures of 285°F coupled with our Total Dry Scrubbing Systems. MWC or RDF facilities using conventional spray dryer/fabric filter combinations have to have economizer gas outlet temperatures about 430°F to allow for evaporation of the lime slurry in the spray dryer without the likelihood of wall build up or moisture carry over. Since the Totally Dry Scrubbing System can operate with economizer gas outlet temperatures about 285°F, the added energy available for sale from adding low outlet temperature economizer heat recovery can be considerable.(Figure 1). This paper focuses on Procedair's new plant and retrofit experience using "Dry Venturi Reactor/Fabric Filter combination with this lower inlet temperature operating conditions.

SYSTEM COMPONENTS