

## Control of oxygen concentration of a boiler firing fuels containing incombustibles

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This study has been carried out to improve the combustion air control system of a boiler firing steel plant off-gases containing incombustibles. A gas analysis station aiming at analyzing combustibles in the fuel gases was installed at a test boiler. A model to calculate the air requirement and the target concentration of oxygen in the exhaust gas was developed and programmed on the process computer for combustion control. Field tests of gas analysis-based combustion control were performed to examine the applicability of the developed method. It was shown that the calorific values of fuel gases fluctuate in the range of 716 - 814 kcal/Nm<sup>3</sup> for fuel "A" and 1,478 - 2,404 kcal/Nm<sup>3</sup> for fuel "B", which implies the necessity of exact combustion control according to the variation of fuel composition. Target concentration of oxygen was calculated to be in the range of 1.4 - 1.7% for normal operating conditions. The improved combustion control system worked well to give consistent results with off-line simulation.