Modelling of NOx emission of a Circulating Fluidized Bed (CFB) boiler with ANN using real operational data

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Due to the ever-increasing demand for electricity globally, there is a need for technologies that can match up in supply. CFB boiler is one of the advanced technologies with that capability due to its wide fuel flexibility and environmentally friendliness compared to other technologies. However, it comes with NOx emission which has very complex kinetics to be well modelled by process computational tools. As a result, a data-driven approach based on ANN is employed in this study. The model developed learns the underlying complexities of this emission using the real operational data of a 500 MW plant and thus represent the true behaviour of the CFB boiler. A prediction error of less than 2.5% was obtained which is an acceptable range in operations and hence can be used in controlling the emissions.