USING LONG-SHORT TERM MEMORY TO PREDICT THE SOx-NOx EMISSION FROM A COAL-FIRED CFB POWER PLANT

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Circulating fluidized bed boiler is a modern green energy technology that has garnered much attention in recent times because of its fuel flexibility and low emission power generation. As a result of the stringent limitations imposed by environmental regulatory agencies on coal fired plants to reduce the quantity of SOx and NOx emissions, their prediction and control have become necessary. it has therefore become imperative to develop solutions to help power plant operators to minimize harmful emissions from the stack while running the operation cleanly and efficiently. This study focuses on the application of LSTM neural network modeling to predict the emission of NOx and SOx in a 500MW CFB plant. Commercial plant data was used to train the LSTM model, and dropout strategy, and modified early stopping was adopted to improve the performance of the model. The model has higher prediction accuracy, faster training time, stronger generalization time and is more competitive in the modeling of NOx and SOx emission. Thus, LSTM is capable of predicting the SOx-NOx emissions from coal-fired boilers and is superior to other traditional times series prediction techniques.