



Operation Data Based Modeling of Generator Power of a 660 MWe Super Critical Power Plant by Artificial Neural Network

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Abstract:

Power production from the large-scale industrial facility is a complex industrial operation and the power plant operation is strictly controlled to ensure the smooth power addition to the grid. In this paper, artificial neural network (ANN) based modeling of the generator power of a 660 MWe super critical power plant is presented. The critically controlled thermo-electric operating parameters and various operation modes of the power plant are represented in the operation dataset taken to construct the flexible ANN model. The quality of the operation data is ensured by the advanced data visualization test, i.e., self-organizing feature map (SOFM). Various ANN models are constructed based upon the number of hidden layer neurons and are validated against the unseen operation data of the power plant. The optimal ANN is selected based upon the prediction performance of the models against the validation dataset, i.e., maximum co-relation coefficient (R) and minimum root mean square error (RMSE) and normalized root mean square error (NRMSE) for the model's prediction. Later, ANN is deployed for simulating the generator power operation of the power plant against the influence of thermo- electric operating parameters of the power plant.

Biography:

Waqar Muhammad Ashraf is an operation engineer at Sahiwal Coal Power Plant, Sahiwal Pakistan. He is MSc in thermal power engineering and has an extensive experience of developing artificial intelligence based data-driven optimization strategies for process control, system level performance enhancement and optimizing the power production. He has 4 years of professional experience in the power sector, overseas training experience and 3 years of experience as technical training incharge of flue gas desulphurization (FGD) and electro-static precipitator (ESP) department. His research interests are industry 4.0, energy systems modeling and clean energy technologies.



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