

Dynamic Simulation of a Drum-boiler During Load Change and Start-up and Shut-down period

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A nonlinear dynamic model has been developed to simulate the load changes and the start-up and shut-down behavior of a natural circulating drum-type boiler. The mathematical model is derived from the first principles of mass, energy, and momentum conservations. The simulation results provide insight into the dynamic interaction of boiler's main variables including the drum pressure, total water volume in the drum-boiler system, steam quality at the top of the riser, and volume of steam under the water level in drum. The results simulation also computes the drum water level based on the total volume of water and volume of steam under the water level in drum. The validation of the model with the experimental measurement is presented