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# A Drum Boiler Turbine Unit Performance Improvement Using PID Control

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### ABSTRACT

Fossil fueled power plant (FFPP) refers to a group of power generation devices that convert the chemical energy stored in the fossil fuel such as coal, gas, oil into thermal energy, mechanical energy and finally electrical energy. The main part in thermal power plant is boiler, that plays main role in steam generation. A boiler Turbine system provides high-pressure steam to drive the turbine in thermal electric power generation. Steam generation systems are a crucial part of most power plants. Therefore, boiler control is an important problem for power plants that are frequently changing load or subject to sudden load disturbances, which are common in current market driven electricity industry. In such circumstances it is required to keep the boiler operating well for large changes in the operating conditions, therefore, the major control objective of a boiler-turbine system is to keep the output of mechanical energy in balance with the electrical load demand while maintaining the internal variables such as drum steam pressure, temperature and drum water level within the desired ranges. One way to achieve this is to incorporate more process knowledge into the control system (Aström and Bell, 2000) In this paper general theory of boiler turbine unit (BTU) is presented, including the steam cycle, the control system of the plant. The equations that are used for the modelling of the plant are also explained.

**Keywords:** Boiler turbine unit; MIMO PID controller; LQG; MIGO Methods; control, MATLAB\SIMULINK.