Dynamic simulation of a 550 MWel coal fired power plant for extended secondary control power output

Abstract: Conventional generation units encounter a changing role in modern societies’ energy supply. Thermal power plants face an increased need for flexible operation and decreasing revenues from selling electricity. Technical adaptations are necessary, though have to be redeemed within very short time spans to secure the plant’s profitability. Dynamic simulation serves as a helping tool to evaluate technical improvements. In the presented work, a 550MWel hard coal fired power plants is modelled in the thermohydraulic simulation code APROS and validated against process data. Characteristic of this model is the implementation of the major part of the control system together with the physical model. This comprehensive model enables detailed simulations with very small error values. As an application example, the extension of a qualified load jump for secondary control power is realized. The dynamic simulation was used to clarify necessary modifications in the control system and assess the implications on plant operation. Therefore tests on site and the risk of an emergency shut down or component failure can be reduced.