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Modeling and study of the reactive power consumption mode of an arc furnace

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A high-performance system for stabilizing the consumption mode of reactive power of an arc furnace (AF) has been developed. The system operates using the principles of thyristor control of the equivalent inductance of the chokes included in the primary circuit of the furnace transformer. The dependencies of the artificial external characteristics of the arc furnace for multicriteria optimal control of the process to stabilize the reactive power consumption mode are substantiated. A computer model of the proposed system for reactive power optimal stabilization of the arc furnace was created. Model studies the integral indicators of dynamics and energy efficiency in the regulation of random disturbances by the proposed system and a typical arc power regulator of the arc furnace. The obtained research results showed a comprehensive improvement in the quality indicators of the dynamics of reactive power stabilization and energy efficiency indicators AF.

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