SIMPLIFIED MODEL OF THE SUBMERGED ARC FURNACE IN THE FREQUENCY DOMAIN

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Abstract

The paper presents guidelines for modeling and analyzing the model of electrode conductance near the zone of submerged arc furnace in the frequency domain. In the first part of the paper the arc models have been reviewed. Finally, the simplified model, which properly recreates the phenomena occurring in the electrode near the zone, is discussed. The identification of the model parameters has been done by means of registered data on a real object in the form of an arc-furnace. The method for constructing simplified frequency models has been described in his paper. The developed theory assumes a mathematical description of the submerged arc furnaces. In order to obtain parameters of frequency models for submerged arc furnaces, the theory of describing functions has been used. In a specific case when the linear part of the system has a clearly selective character, the parameters of the frequency model can be expressed as a function of the first harmonic of a flowing current. This method allows to obtain an equivalent to classical Thevenin model of submerged arc furnace for a fixed working point. These models contain complex LLS multipoles for the first harmonic and sources of the higher harmonics of voltages. The difficulty of the application of the frequency model of the arc are also discussed.

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