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Electric Arc Furnaces as a Source of Voltage Fluctuations in the Power System

Authors : Zbigniew Olczykowski

Abstract : The paper presents the impact of work on the electric arc furnace power grid. The arc furnace operating will be modeled at different power conditions of steelworks. The paper will describe how to determine the increase in voltage fluctuations caused by working in parallel arc furnaces. The analysis of indicators characterizing the quality of electricity recorded during several cycles of measurement made at the same time at three points grid, with different power and different short-circuit rated voltage, will be carried out. The measurements analysis presented in this paper were conducted in the mains of one of the Polish steel. The indicators characterizing the quality of electricity was recorded during several cycles of measurement while making measurements at three points of different power network short-circuit power and various voltage ratings. Measurements of power quality indices included the one-week measurement cycles in accordance with the EN-50160. Data analysis will include the results obtained during the simultaneous measurement of three-point grid. This will determine the actual propagation of interference generated by the device. Based on the model studies and measurements of quality indices of electricity we will establish the effect of a specific arc on the mains. The short-circuit power network's minimum value will also be estimated, this is necessary to limit the voltage fluctuations generated by arc furnaces.

Keywords : arc furnaces, long-term flicker, measurement and modeling of power quality, voltage fluctuations
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