

Developing a Regulator for Improving the Operation Modes of the Electrical Drive Motor

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Abstract : The operation modes of the synchronous motors used in the production processes are greatly conditioned by the accidentally changing technological and power indices. As a result, the electrical drive synchronous motor may appear in irregular operation regimes. Although there are numerous works devoted to the development of the regulator for the synchronous motor operation modes, their application for the motors working in the irregular modes is not expedient. In this work, to estimate the issues concerning the stability of the synchronous electrical drive system, the transfer functions of the electrical drive synchronous motors operating in the synchronous and induction modes have been obtained. For that purpose, a model for investigating the frequency characteristics has been developed in the LabView environment. Frequency characteristics for assessing the transient process of the electrical drive system, operating in the synchronous and induction modes have been obtained, and based on their assessment, a regulator for improving the operation modes of the motor has been proposed. The proposed regulator can be successfully used to prevent the irregular modes of the electrical drive synchronous motor, as well as to estimate the operation state of the drive motor of the mechanism with a changing load.

Keywords : electrical drive system, synchronous motor, regulator, stability, transition process

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