Annotation

In the thesis, a mathematical model of Simulink is developed and investigated of a frequency-controlled twin-engine with an electromechanical system of an asynchronous electric drive with a rigid mechanical connectiontaking into account the real discrepancy between the parameters and mechanical characteristics of the tested engines. During the tests, the causes and dependencies of the formation of the process of uneven distribution of the load were determined, including the transition to the generator mode for a frequency-controlled electric drive with vector control and speed feedback. In addition, the fact of the influence of gap formation and elasticities of gears on the process of formation of an imbalance of moments was established..

Modeling of the electromechanical system showed that a twin-motor asynchronous gear drive generates a significant imbalance in the distribution of the total load between the drives and reaches 13-20%, what indicates the need for an extension with the SVN scheme; tests OF the svn "lead-lead" on the lift mechanism confirmed high technical indicators of load distribution, both in static and in transient operation. The accuracy of load distribution, as in experiments, is ~1-2%. Thanks to the structural changes made and the use of the developed SVN "leading-leading", vibration and vibrations of the mechanism are significantly reduced, which means that the durability has increased.

On the example of a mine lifting machine of the NKMZ 2C-5*2,3 type, the electric drive system is studied, and the problem of energy saving is considered: the calculation of energy savings and reduction of losses in the electric drive when replacing the rotary station of an electric motor with a phase rotor with an adjustable electric drive is carried out, which is the purpose of the work. The economic effect of using frequency converters is shown: reduction of equipment breakdowns and accidents, more precise regulation of acceleration and deceleration of the skip; energy savings of 9.8%; and all the sliding power of the rotor of electric motors through the frequency Converter is returned to the supply network of 6 kV 50 Hz, and is not spent on heating the rotor resistances and heating the motor