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MATHEMATICAL SIMULATION OF TRANSIENT CABLE LINE FOR THE LOSS IN THE SCREEN

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Ensuring reliability and efficient operation of cables in conditions of forced electrical overload is today an urgent problem. When overloading occurs degradation raceway cable insulating elements, which may lead to failure of the duct in general. Predicting performance cables, which is impossible without analyzing the temperature and electromagnetic fields for specific operating conditions lines is an important task.

This study focuses on the definition of the performance of cable lines, taking into account the thermal losses in the metal protective screens at the unsteady operation of the cable channel in a complex heat. A mathematical model describing the electromagnetic and thermal fields, taking into account losses in the shields and convective heat transfer in the duct [1]. The problem is solved by the finite element method in engineering package ANSYS Fluent and Maxwell.

The studies were obtained temperature field in the cables (especially in the cable insulation) and the cable channel as a whole, the field distribution of the electric and magnetic fields in the cable lines. The main criterion for the smooth operation of cable lines is not exceeded the operating temperature of the cable insulation. Based on the latter were determined maximum allowable load of cables and provides recommendations for optimal load cables. The paper analyzes the unsteady mode cable lines in different environments: at rated load and under overload cable channel. Defines acceptable time cables under overload. Results may be used when calculating the cable at the moment when, in emergency or overload operation mode, enabling operation of cables a predetermined level of reliability.

REFERENCES

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