



Technical Sciences, Abnormal Overvoltages in Main Electric Networks with Distortion Sources: Monograph / V. G. Kuznetsov, Yu. I. Tugay, V. V. Kuchansky. – Odesa: Publishing House "Helvetica", 2025. – 170 p.

ISBN 978-617-554-449-5

The monograph presents the analysis results of the occurrence conditions, nature of development and possible consequences of abnormal modes of electric networks with extreme values of mode parameters, such as overvoltages and overcurrents, which traditionally performed using mathematical models with linear and symmetric elements. This is explained by the extensive experience in developing and using models of this class in practice, since the basis for decision-making during the design and operation of networks are the results of modeling, primarily, normal modes. At the same time, a more detailed analysis shows that the presence of sources of distortion in modern power grids, mainly asymmetry and non-sinusoidality, significantly affects the current values of the mode parameters, including the probability of these values passing through the limit limits. The monograph also presents improved analytical methods and develops appropriate simulation and mathematical models for the study of abnormal overvoltages during their occurrence, development and existence, the solution of which this work is devoted to, is an urgent scientific and practical problem.

In the monograph also considers the application of the developed methods and models for identifying factors in power grids that have the greatest impact on the occurrence and frequency of overvoltages, as well as for the selection of means of preventing and limiting abnormal overvoltages. The book is aimed at scientists and specialists involved in the study of operating modes of main power grids.