Overvoltages in asymmetrical modes of main electric networks: monograph / Yu. I. Tugay, Yu. G. Likhovyd, V. V. Kuchanskyy. – Odesa: Publishing house "Helvetica", 2025. – 132 p.

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The monograph examines the main causes of failure of extra-high voltage power transmission lines, the main of which is the phenomenon of overvoltages - an abnormal increase in voltage above the maximum permissible value. This can be explained by the factor of the presence of a small insulation reserve for elements of main electric networks due to their high cost. Overvoltages of the steady-state mode arise due to the asymmetry of the electric network, which in turn arises due to asymmetrical short circuits or due to incomplete phase modes of operation (repair work on the phase, phase break, incorrect operation of the switch phase during switching).

The paper notes that currently, most of the operating modes of electrical systems are asymmetrical, since modern three-phase electrical systems contain a significant number of various elements that act as sources of asymmetrical currents and voltages. They can exist for a short time and for a long time. In most cases, the asymmetry is insignificant and does not lead to significant errors in the calculations. However, there are cases when the asymmetry is significant, and it must be taken into account in the calculations. Short-term modes are caused by the occurrence and subsequent elimination of short circuits, phase-by-phase disconnections and switching on of switches and other switching devices. They also occur in cases of complex damage (simultaneous short circuits and phase break), for example, in the single-phase automatic reclosing cycle.

The book is aimed at scientists and specialists involved in the study of the operating modes of main electrical networks.