OPTIMAL SYNTHESIS OF INTELLIGENT INFORMATION CONTROL SYSTEMS OF A NUCLEAR POWER PLANT POWER UNIT FOR MANOEUVRABLE OPERATING MODES

Usyk, A.Y., Severin, V.P.

National Technical University «Kharkiv Polytechnic Institute», Kharkiv

Modern nuclear power plants (NPPs) play a key role in ensuring the stability of electricity supply and the development of the energy sector.

However, given the growing need for flexibility and manoeuvrability in electricity generation, it is necessary to develop new approaches to managing the operation of NPP units aimed at optimising their operating modes [1,2].

The purpose of the report is to analyse the problem of optimal synthesis of intelligent information control systems (IICS) for NPP power units in order to ensure efficient control in manoeuvrable operating modes.

The methods and algorithms that allow to create such control systems are studied, in particular, by using fuzzy logic, neural networks, optimisation methods and data analysis.

The paper considers the formalisation of the problem of optimal control of a NPP power unit in load-following modes and provides a relevant theoretical justification for the choice of methods for the synthesis of IICS.

Practical aspects of application of the developed control systems at real Ukrainian NPPs are also considered in order to improve their efficiency and safety of operation.

The obtained research results can be useful for specialists in the field of energy and automation working on improving control systems of nuclear power plants, as well as for scientists studying intelligent control systems in energy and industrial processes [3].

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