DESIGN OF AN INFORMATION SYSTEM TO IMPROVE THE EFFICIENCY OF STEAM GENERATOR CONTROL AT NUCLEAR POWER PLANTS

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Relevance of the Topic.

The steam generator is one of the key components of the energy circuit at a nuclear power plant (NPP), responsible for transferring heat from the reactor to the turbogenerator. Its stable and efficient operation is critically important for ensuring the safety and economic efficiency of NPP operation.

Purpose of the Study.

To develop an information technology solution for optimizing the steam generator control system in order to improve the reliability, energy efficiency, and adaptability of the equipment under real operating conditions.

Research Objectives.

1. Analyze existing control systems for steam generators at NPPs;
2. Identify the main control and regulation parameters: pressure, temperature, water level, and coolant flow rate;
3. Investigate the potential use of predictive control and machine learning algorithms to optimize processes.

Structure of the Developed Information Technology.

1. A real-time monitoring and diagnostics module for the steam generator condition;
2. Intelligent algorithms for forecasting changes in technological parameters;
3. A decision support system for operational adjustment of operating modes.

Expected Implementation Results.

1. Increased safety in the operation of NPP steam generators;
2. Reduction in energy and operational costs;
3. Improved system responsiveness to dynamic load changes.

Prospects for Further Research.

Future research will focus on testing the technology under simulated emergency conditions and its integration into existing automated control systems at NPPs.

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