PROSPECTS OF ARTIFICIAL INTELLIGENCE: AI IN THE NUCLEAR POWER INDUSTRY

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Nuclear power plants in Ukraine are one of the main enterprises in the country's energy sector, providing about half of electricity generation. As of October 2024, there are three nuclear power plants in Ukraine (ZNPP is still under

occupation), and the development of nuclear power requires modern technologies to improve efficiency, safety and reliability. One of the most promising areas for the development of the nuclear industry is the introduction of artificial intelligence (AI).

The use of AI can contribute to more efficient plant management, improve safety, reduce costs and mitigate risks to personnel and the environment. Artificial intelligence has the potential to improve various aspects of NPP operation. There are several areas where artificial intelligence can be used: diagnostics of operating equipment, forecasting emergencies, AI can be used to create simulations of emergencies, which allows NPP personnel to undergo training in conditions as close to real-life as possible. This allows employees to practice their skills and be prepared for possible emergencies. At the same time, there are certain obstacles that we will need to consider and overcome. For example, low and/or slow return on investment, high upfront costs of assets and/or financial risk, and lack of access to finance. I would also like to highlight cybersecurity, as data security is becoming a serious issue as more and more consumer data is collected through network-connected devices. AI automation requires reliable protection against cyber threats, as cybersecurity is critical to the operation of nuclear power plants. Before implementation, Ukraine must work on developing protection systems to ensure that critical infrastructure is protected from possible threats. Another important part is the personnel who will be able to work and constantly modify AI, which is why it is important to attract specialists to the nuclear power industry in the future.

Artificial intelligence has great prospects in the nuclear energy market. The introduction of AI can improve the reliability and efficiency of nuclear power plants, but there are a number of obstacles on the way, including the feasibility of introducing AI in wartime and, in the future, post-war conditions. There is a lot of work and space for reflection ahead.

Reference

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