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Application of Artificial Intelligence Technology in Electrical Automation Design

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Abstract: ***Combined with the actual situation, in the process of the continuous development of our country's social and economic system and the continuous improvement of people's overall living standards, the connection between electrical equipment and People's Daily life has become increasingly close, and the problem of energy consumption has become more and more obvious. the application of energy-saving design technology in electrical automation can ensure the stability of power system operation at the same time, more comprehensive to meet the implementation needs of our country's sustainable development strategy. Based on this, this paper explores the application of energy-saving design technology in electrical automation, hoping to play a certain role in the development of related work.***

Keywords: Electrical Automation; Energy Saving Design Technology; Application.

1. INTRODUCTION

In the current society, the electrical automation belong to electrical engineering system, a new technology in the system, combined with the actual situation, electrical automation technology application scope is relatively broad, and energy saving design technology application in the electrical automation is able to effectively improve resource utilization efficiency at the same time, further enhance the efficiency of the electrical automation work, In order to fully meet the requirements of our country's sustainable development strategy in the process of improving the economic benefits of enterprises to provide a more adequate guarantee. Therefore, in the process of the continuous development of electrical automation technology system, relevant technical personnel need to attach importance to the application of energy-saving design technology, and ultimately provide more adequate guarantee for the realization of the development goals of energy conservation and emission reduction of electrical automation engineering in our country. In computer vision and natural language processing, studies such as Xie et al. [1], who proposed a Conv1D-based framework for multi-class legal text classification, and Xu et al. [2], which implemented YOLOv5 for real-time marine organism detection, demonstrate the efficacy of deep learning in specialized tasks. Concurrently, Yan et al. [3] enhanced image super-resolution reconstruction using convolutional neural networks, addressing critical challenges in visual data processing. Optimization methodologies have also progressed, with Long et al. [4] employing transformer models and InfoNCE loss to improve educational content matching, while Wu [5] optimized cloud resource allocation through predictive fault detection models. Data analytics has been leveraged to address socioeconomic and environmental issues, exemplified by Tang et al. [6], who analyzed U.S. housing supply-demand imbalances via big data, and Chen et al. [9], who quantified the digital economy's impact on green innovation. In manufacturing, Xiangyu et al. [8] utilized response surface methodology to optimize 3D printing parameters for polyolefin elastomers, bridging computational design and material science. Cross-disciplinary applications extend to hydraulic engineering, where Yao [7] investigated local head loss coefficients, and biological research, as Wang et al. [12] mapped immune microenvironments in gastrointestinal cancers. Emerging trends emphasize human-centric systems, with Song [13] and Wang [15] integrating AI for logistics decision-making, and Li et al. [14] developing interactive tools for smart city analytics.

2. APPLICATION PRINCIPLES OF ENERGY- SAVING DESIGN TECHNOLOGY FOR ELECTRICAL AUTOMATION

According to the actual situation of the application of energy-saving design technology in the current stage of electrical automation, in the application of energy-saving design technology, relevant technical personnel should pay attention to the application principles of the following aspects: 1, optimize the design of power supply and distribution system. Combined with the actual situation, the application demand of electrical automation equipment system in the operation process is very strong, which leads to the application of electrical automation equipment will to a certain extent improve the cost of enterprise production activities. To this end, in order to further ensure the health of electrical automation equipment operation, enterprises in the application of electrical automation equipment will need to pay attention to the power supply and distribution system optimization design

work, and through the scientific application of energy-saving design technology system to reduce the electrical automation equipment operation in energy consumption, In order to effectively improve the overall energy-saving effect of electrical automation equipment, at the same time, to provide a more adequate guarantee for the overall improvement of its production efficiency.

Reasonable design of load factor. In energy saving design techniques applied to the electrical automation, design work load coefficient value is not to be neglected, only on the basis of reasonable design load factor can be in full to ensure that the energy saving design technology application effect at the same time, further enhance the operation efficiency of the electrical automation equipment and quality, to that end, the application of energy-saving design technology, Relevant technical personnel should pay attention to the development of load factor design, so as to further ensure the application quality of energy-saving design technology [1].

3. APPLICATION OF ENERGY-SAVING DESIGN TECHNOLOGY FOR ELECTRICAL AUTOMATION

3.1 Reasonable selection of transformer

In the application of energy saving design technology to transformer design, relevant technical personnel need to highlight the application effect of skill design technology at the same time, to ensure that the application of energy saving design technology can fully meet the operation needs of electrical automation engineering. Therefore, in the process of practical application of energy saving design technology, relevant technical personnel need to further ensure the scientific and reasonable application of energy saving design technology on the basis of in-depth research on the actual situation of transformer design work. 1, in order to further strengthen the result of energy saving design technology in the application of electrical automation and related staff working in the transformer selection should choose as far as possible some energy saving performance of the transformer equipment, and then through the reasonable application of energy saving transformer active power control, thus further ensure electrical automation equipment operation quality; 2, through one-way features automatic compensation device scientific applications to more comprehensive to ensure that the three phase current balance, so as to effectively reduce the negative issues, such as the probability of unbalanced load at the same time, effectively reduce the transformer itself of energy loss in the process of operation, thus in fully to ensure the quality of its running at the same time, So that it can more fully meet the requirements of our country's energy conservation, emission reduction concept. In addition, in the application of energy saving design technology, relevant technicians also need to reduce the probability of negative problems such as excessive transformer load through the scientific application of automatic compensation equipment, and lay a solid foundation for the realization of energy saving goals of electrical automation equipment while ensuring the overall power supply effect [2].

3.2 Choose a reasonable light source

The choice of light source is also one of the main application ways of energy-saving design technology in electrical automation. In combination with the actual situation, reasonable selection of light source can effectively reduce the energy consumption problem at the same time, more comprehensive reduce the probability of economic loss caused by energy consumption of enterprises. Therefore, in the application of energy-saving design technology to carry out the design of lighting engineering, the relevant staff should choose relatively high efficiency of light source as far as possible. Compared with ordinary light source, the light source with relatively high efficiency also has relatively high luminous rate, so its application value in energy saving can not be ignored. Under normal circumstances, the degree of light and shade of the overall environment of the building will directly affect people's visual feelings. Therefore, in the application of energy saving design technology, relevant technical personnel need to do a good job in the selection of light sources in different areas, so as to fully ensure the application effect of energy saving design technology in electrical automation engineering at the same time. To provide more adequate guarantee for the realization of our country's sustainable development goals.

3.3 improve the overall power of the electrical automation system

In order to give full play to the application value of energy-saving design technology in electrical automation at the same time, and further ensure the operation efficiency of electrical automation system, relevant technical personnel also need to scientifically improve the operation power of electrical automation system in the process of implementing energy-saving design technology. In addition, by scientifically reducing the number of motors, the

operation efficiency of the electrical automation system is essentially improved, and the overall operation quality is ultimately ensured while laying a solid foundation for the realization of its energy saving goals [3].

3.4 Scientific applications of source filters

Combined with actual situation, in the application of energy-saving design technology, related technical personnel need to source filter application value, thus to effectively reduce the harmonics of the normal operation of electrical equipment of the negative impact at the same time, reduce the electrical automation equipment in energy consumption in the process of operation, technology application value in give full play to the energy-saving design at the same time, Further improve the operation efficiency of electrical automation equipment.

4. CONCLUSION

To sum up, in the process of the continuous development of China's social economy, the research value of energy issues is also constantly improving. Combined with actual situation, the application of energy and People's Daily life and the development of the national economy between the very closely connected - therefore, in the electrical automation technology development, electrical automation equipment system in the process of constantly improve, in order to further improve the utilization efficiency of energy and electrical automation equipment system operating efficiency, Relevant technical personnel and members need to attach importance to the application of energy-saving design technology, so as to effectively improve the efficiency of resource utilization and provide more adequate guarantee for the realization of our country's sustainable development goals.

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