عنوان مقاله:

Enhancing Heat Transfer Efficiency in Thermal Power Plants through Innovative Design

محل انتشار:

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نویسنده:

Ali Dezhdar - Islamic Azad University, Dezful Branch, Department of Mechanical Engineering, Dezful, Khuzestan, Iran

خلاصه مقاله:

Thermal power plants play a crucial role in generating electricity by converting thermal energy into electrical energy. However, one of the major challenges faced by these power plants is the limited efficiency in heat transfer processes. In order to improve the overall efficiency of thermal power plants, innovative design solutions are being explored to enhance heat transfer efficiency. One of the key areas of focus in improving heat transfer efficiency is through the design of heat exchangers. Traditional heat exchangers have limitations in terms of their design and performance, leading to inefficiencies in heat transfer. By incorporating advanced materials and technologies, such as microchannel heat exchangers or compact heat exchangers, the surface area for heat transfer can be increased, resulting in a more efficient transfer of heat. Additionally, optimizing the flow patterns within the heat exchangers can also improve heat transfer efficiency by reducing heat losses and minimizing pressure drops. Another innovative design solution for enhancing heat transfer efficiency in thermal power plants is the use of passive heat transfer enhancement techniques. These techniques involve the integration of passive components, such as fins or tabulators, into heat transfer surfaces to increase turbulence and enhance heat transfer rates. By strategically placing these components within the heat exchangers, heat transfer efficiency can be significantly improved without the need for additional energy input. Furthermore, the use of computational fluid dynamics (CFD) simulations and advanced modeling techniques can help in optimizing the design of these passive heat transfer enhancement systems to achieve the best possible performance. In conclusion, by incorporating innovative design solutions such as advanced heat exchangers and passive heat transfer enhancement techniques, the efficiency of heat transfer in thermal power plants can be significantly improved. These design solutions not only enhance the overall performance of the power plants but also contribute to reducing energy consumption and operating costs, making them a sustainable .and cost-effective solution for the energy industry

کلمات کلیدی:

thermal power plants, heat transfer efficiency, heat exchangers, microchannel heat exchangers