

DAMLESS HYDROELECTRIC POWER PLANT

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Abstract. The thesis explores the potential of using damless hydroelectric power plants as an effective and environmentally friendly solution to meet energy needs and reduce negative impact on the environment. It is determined that the implementation of such plants can provide sustainable development and address global environmental challenges. However, a thorough environmental impact assessment and cost calculation for the construction and maintenance of the plant are necessary before its implementation.

Keywords : damless hydroelectric power plant, renewable energy, sustainable development, environmental impact, cost calculation.

Introduction. In recent years, there has been an increasing focus on finding alternative and sustainable sources of energy to meet the growing energy demands of the world. One such source is hydroelectric power, which has been in use for many years. However, traditional hydroelectric power plants that use dams can have negative environmental impacts and can be costly to construct and maintain. In this context, the concept of damless hydroelectric power plants has gained attention as a potential solution that can meet energy needs while minimizing negative environmental impact. This paper explores the potential of using damless hydroelectric power plants and the considerations that need to be taken into account for their successful implementation.

Text. Damless hydroelectric power plants are a promising direction for the development of renewable energy. They work by densifying the water flow, which allows for energy to be generated without the use of dams. This technology has no negative impact on the natural environment, which helps reduce the impact on the river ecosystem and lower construction and operational costs.

The aim of this dissertation is to develop a damless hydroelectric power plant on small rivers and streams, which would provide energy self-sufficiency for remote areas and reduce dependence on traditional energy sources. The research includes an analysis of technical possibilities, design development of a damless hydroelectric power plant, and a study of its environmental impact and economic efficiency.

The results of the research will demonstrate the potential of using damless hydroelectric power plants to address energy problems in remote areas and help reduce the negative impact on the environment. The conclusions and recommendations obtained during the study can be used for further development of damless hydroelectric power plant technology and ensure the economic and ecological sustainability of electricity production.[1]

To implement a project of a run-of-river hydroelectric power station, it is necessary to conduct technical analysis and research on the potential of the corresponding river. In the process of designing the station, many factors need to

be taken into account, such as the height of the drop, the size and topography of the river, as well as the power required to meet the needs of consumers.

The use of run-of-river hydroelectric power stations solves many problems associated with the construction and operation of dammed hydroelectric power stations. Dams not only can have a negative impact on the environment but also create additional costs for construction and maintenance.[2]

One of the main advantages of run-of-river hydroelectric power stations is their environmental friendliness, which allows reducing the negative impact on the natural environment and preserving natural resources. Moreover, they can be installed on small rivers and streams, which allows providing energy to remote areas.

However, it is also necessary to take into account the costs of building and maintaining a run-of-river hydroelectric power station, as well as determine its efficiency. It is also worth paying attention to the fact that the concentration of water flow can affect the water temperature and the composition of the river ecosystem.

In summary, the implementation of the technology of a run-of-river hydroelectric power plant can be an efficient and environmentally friendly solution to meet the energy needs of the population, reduce environmental impact, and ensure sustainable development. However, a thorough assessment of the impact on the natural environment and the calculation of the cost of construction and maintenance of the plant are necessary before implementing this technology.[3]

In addition, it is important to consider the use of run-of-river hydroelectric power plants as a source of energy in backup power systems and their combination with other types of energy sources, such as solar and wind power plants.

There are already examples of the use of run-of-river hydroelectric power plants in the world, such as the station in Canada on the Saskatchewan River, which provides energy to over 2,000 households. Also, a project is being developed in Switzerland to build a run-of-river hydroelectric power plant on the Rhine River.[4]

Therefore, the use of run-of-river hydroelectric power plants can become an efficient and environmentally friendly solution to meet energy needs, reduce negative environmental impact, and ensure sustainable development. However, a detailed assessment of the environmental impact and calculation of the cost of construction and maintenance of the plant are necessary before implementing this technology.

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