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System approach to renewable energy use in power supply

D Kodirov^{1*}, O Tursunov^{1,2,3}, D Talipova⁴, G Shadmanova⁵, S Parpieva¹, and B Shafkarov⁶

¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan

²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China

³Research Institute of Forestry, 111104 Tashkent, Uzbekistan

⁴Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan

⁵Department of Information Technologies, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan

⁶Department of Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan

*Email: d.kodirov@mail.ru

Abstract. Based on the analysis of current developments in small hydropower plants, the structural scheme and installation scheme of a dam without hydropower were developed. According to the developed scheme, a small hydroelectric power plant was installed and prepared for testing. During the study, an analysis of 3 magnitudes (V), voltage frequency (Hz) and sinusoidal coefficient (%) that determine the quality indicators of electricity was presented. The obtained results are compared with the value limits given in the international standard normative document.

1. Introduction

Scientific research aimed at expanding the use of non-conventional and renewable energy sources, saving hydrocarbon fuel energy resources and stabilizing the ecological balance is gaining importance in energy practice worldwide. In this regard, the long-term national energy programs of developed countries set a task to increase the share of renewable energy sources to at least 20% [1]. In this regard, in the world practice, the use of micro-hydroelectric power plants, which are one of the largest sources of renewable energy in the power supply system, is in full swing, turn, special attention is paid to the development of this industry.

In the world, special attention is paid to the scientific supply of reliable and environmentally friendly technologies for electricity generation. Of particular importance in this area, including the modeling of structural and operating parameters of micro-hydropower plants operating at low pressure water flows, improving the design, development of technology that increases the efficiency of use in low pressure water flow systems.

There are foothills and small streams in the country, where it is possible to build micro-hydroelectric power plants to generate electricity. But so far little attention has been paid to the construction of such small-capacity hydropower plants. Until now, the main focus has been on the construction of large

