ГОСУДАРСТВЕННЫЙ КОМИТЕТ ПО ГРАДОСТРОИТЕЛЬСТВУ И АРХИТЕКТУРЕ АЗЕРБАЙДЖАНСКОЙ РЕСПУБЛИКИ

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АЗЕРБАЙДЖАНСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ СТРОИТЕЛЬСТВА И АРХИТЕКТУРЫ

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THE ANALYSIS OF VIBRATIONAL EFFECT FROM THE TOWER BLOCK TO THE FOUNDATION OF THE WIND POWER UNIT (WPU) OF EREYMENTAU WIND POWER STATION (WPS)

АНАЛИЗ ВИБРАЦИОННОГО ВОЗДЕЙСТВИЯ ОТ БАШНИ К ФУНДАМЕНТУ ВЕТРОЭНЕРГОУСТАНОВКИ ЕРЕЙМЕНТАУСКОЙ ВЭС

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Аннотация. В данной статье по результатам натурных наблюдений приведен анализ вибрационного воздействия от башни к фундаменту ветроэнергоустановки (ВЭУ) Ерейментауской ВЭС.

Показаны графики зависимости вибрационной нагрузки, воспринимаемой фундаментом ВЭУ от интенсивности напора ветра.

Ключевые слова: ветроэнергетика, ВЭС, ВЭУ, колебания, вибрации, фундамент.

Abstract .This article includes the analysis of vibrational effect from the tower block to the foundation of the wind generating unit of Ereymentau WPS.

In the article are presented diagrams of dependence of vibrational load taken by the WPU foundation from wind pressure intensity.

Keyword: foundation, variations, vibrations, wind power, WPS, WPU.

Introduction. Wind power is the most dynamically developing type of renewable energy sources. Having studied the energy potential of wind in Kazakhstan, the Government of the Republic of Kazakhstan together with the UN development Program "Kazakhstan is the initiative of the development of wind power market" has resolved that the Ereymentau district of Akmola region is the most perspective area for the construction of wind power stations [1].

The first steps in the Program realization were taken in Ereymentau district of Akmola region.

Currently 22 WPUs have been maintained. They are connected to Ekibastuz power transmission line and supply Ereymentau district, Erkenshilik settlement, and Astana city (partially) with electrical power.

Within the context of an upcoming exhibition "EXPO-2017" in Astana it is planned to provide power supply of the exhibition facilities by using the energy of Ereymentau WPS.

1 Construction site description

The areas for WPU building are located on the territory free from construction. The prevailing forms of relief are dome-shaped bald mountains composed of dense rocks. The bald mountains are separated by dry small ravines and blind creek lowlands which are confined to less resistant rocks. The relative excess of bald mountains ranges from 30 to 110 meters.

The geological structure of this territory includes sedimentary and metamorphic rocks of the Proterozoic and Paleozoic periods which are broken out by intrusions in the North-Eastern part of he city, overlaid by residual and talus quartenary sediments consisted of clay loams, sand loams and loams with land waste and broken stone, loam and clay loam saprolites, broken stone-land waste and land waste-broken stone subsoil with sand and clay loam filler.

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