THE INITIAL VELOCITY METHOD OF INFORMATION ON THE ORIGIN OF CAVITATION IN WATER RESERVOIRS

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Annotation: *Erosion in liquid motion is caused only by bubbles in the vicinity of a few millimeters thick layer of water directly touching or near the erodible surface. If the lumpy areas in the lumpy zone are interrupted by water-dissolving shrinkage elements, the cavitation bubbles collected inside them do not come into contact with the surface of the coating, it does not crumble. These conditions have been used in the production of solutions known as non-erosion energy quenchers. One of the many schemes of the erosion-free slot construction of the fence is shown. The presence of countermeasures - diverters on the lower flange of the groove and the concave behind the threshold of the flow in the non-pressurized mode behind the shutter and the deflectors on the lower grain of the groove ensure the separation of the flow from the wall of the aqueduct and the ventilation that occurs in the air layers.*

Keywords. *Mathematical programming; modeling; hydraulic pumps; cavitation*

INTRODUCTION

According to this method, the possibility of operation of the facility within the incubation period is the initial speed $\vartheta_{пор}$ is determined by the introduction of the concept. Here, initial velocity is understood as guaranteeing that no decay occurs within 48 hours of any form of excitation and cavitation stages. In Figure 2, K is the strength of the concrete cover in compression $\vartheta_{пор}$ and air flow in front of the wall φ',% a graph of the dependence of the level of aeration is presented.

$$\varphi' = \frac{Q_{воздух}}{Q_{вода}} \cdot 100$$

τ guarantee that there will be no decay during the hour, $\vartheta_{хар_{пр}}$ belonging to the upper limit speed is calculated by the initial speed according to equation (4).

$$\vartheta_{хар_{пр}} = \vartheta_{пор}\left(\frac{48}{\tau}\right)^{\frac{1}{10}} \qquad (1)$$

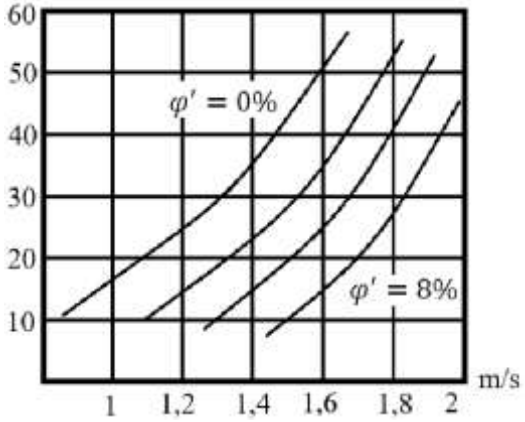

Figure 1. Dependence of the initial speed on the strength of the concrete cover, aeration and the pre-wall layer

This method allows the structure to function for a long time until the effect of the properties of the protective layer of the material and the level of flow aeration are taken into account at a certain level. Dependence of the initial speed R on the strength and aeration of the concrete cover, 0.8% pre-wall layer. The data in the figure are two-dimensional cylinder diameters of cavitation $d = 28мм$ dimensions in the working chamber $a \times h = 26 \times 160 мм$ obtained according to the results of decay studies.

ϑ_d under conditions of equal speed, the drag of the pile track is in the near border behind the cylinder and ϑ_{xap} It is considered that the effect of cavitation on the unit area of hydrostructures in real conditions will not be more intensive than that shown in laboratory conditions (regardless of the stage of cavitation, the scale of the cavitation inducer, its shape, etc.). However, this assumption has not been tested in natural data and creates uncertainty. In addition, the explained method takes into account a very limited set of factors, which would have a real impact on the durability of the elements of water discharges.

When the lumpy zones in the lumpy zone are interrupted by water-dissolving shrinkage elements, the cavitation bubbles collected inside them do not come into contact with the surface of the coating, it does not erode. These conditions have been used in the production of solutions known as non-erosion energy quenchers. The same idea was used to prepare the elements of barrier chambers. Although the countermeasures in this case are the repeller: cavitation is formed ($K_{кр} = 1{,}6см$ sharp-edged bulge), but the cavitation bubbles first move along the boundary of the air layer, where they do not touch the wall, instead of touching the wall, the midstream is filled with air, which excludes the formation of erosion does.

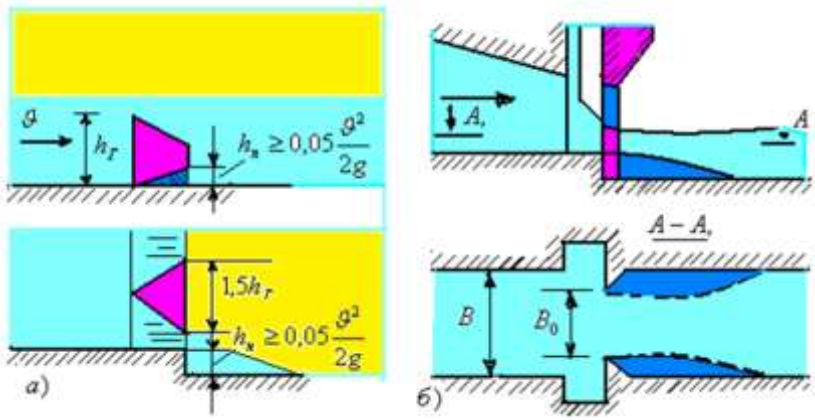

Figure 2. Examples of non-erosion structural elements in spillway structures; a) energy extinguisher, b) umbrella shutters with extinguishers.

At present, shutter chambers are made using steel coatings. The most effective non-erosion coating of the steel sheet is covered with artificial corrugation (5), steel triplets are erected. The height of the corners of the roughness elements $\Delta h = 0{,}1 - 0{,}2м$ step equal to $l_ш = (5-6)\Delta h$ will be.

The use of such ups and downs reduces the speed on the surface of the bottom and walls. A break zone directly behind each riser element provides good aeration and guarantees no contact with the steel cladding in the break zones. The main advantage of such constructions is the absence of erosion, that is, the absence of decay that often occurs on the next concrete surface with a steel coating.

CONCLUSION

The mechanism of water capture of air on the free surface with flow can have two explanations:

- when the kinetic energy of a drop of water taken from the stream is greater than the work of gravity and gravity on the surface of the liquid, the droplet is thrown from the free surface and the water absorbs the air on the surface of the cavern.

- in both regimes, the deceleration of the flow twist occurs intensively in the initial section. Hydraulic losses are different for different modes, and the increase of hydraulic losses in turns allows to effectively dissipate its excess energy.

In order to prevent the formation of cavitation, it is possible to use lumped flows to moderate the flows. The ability to transfer the current during the rotation of the funnel decreases, however, water throwers with a shaft are used, in which the current that has received a certain rotation continues to rotate in the axis of the core, and an air core is formed. The relative radial velocity in the turbulent regime is less than the laminar velocity. The pressure distribution and relative energies in different input parameters were determined.

With the increase of tangential equality in the initial section, the flow rate increases and the cavitation safety of the tunnel wall is ensured. The hydraulic model of the movement of the main water transfer facility, as well as the possible options for

transferring the liquid through the conical valve without vibration, are defined. As the velocity of the multiphase flow increases, a low-pressure zone appears, where the flow of water is filled with air, which creates an opportunity for aeration processes to occur. The reasons for the formation of aeration zones are disruption of free surfaces by turbulent resistance, loss of wave continuity on a free surface, total loss of fountain-like eruption, cavitation process, mixing of water flow (mixing) with a free surface. collision. Analytical formulas for the study of high-pressure flows through a conduit, modeled as pressurized non-standard flow.

The obtained results were tested on the Pachkamar reservoir discharge pipeline and engineering communications pipeline.

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