Procedia of Theoretical and Applied Sciences
Volume 1, | August 2022
ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

ASSESSMENT OF VIBRATIONS IN THE TURNING PART OF THE TURBULENT FLOW AT THE WATER OUTLET OF THE KARKIDON RESERVOIR

Muminov Oybek Alisher ugli
Doctorate, Department of Civil engineering construction, faculty of Construction
Fergana Polytechnic Institute

Xudayqulov Sovet Ishanqulovich
Doctor of Technical Sciences, Professor, Scientific Research Institute of Irrigation and Water Problems

In the channel of the Karkidon reservoir with sloping walls, hydraulic processes that are formed in the diversion of the current flowing in the water transfer tunnel:

If the channel has a transverse slope, then a Virage is formed in the stream. The lower part of the cross-section at the turn of the Uzan can be straight or curved. In turn, there are many works dedicated to the calculation of flow parameters, the study of which was carried out in the ideal fluid flow. When researching a real, i.e. Real liquid flow, it is usually assumed that only the longitudinal composition of the velocity is present. There are also works in which fluid circulation is also taken into account, and in turn the flow is again considered two-dimensional ($u_z = 0$).[1]

We derive the calculated dependencies from the Euler equation in polar coordinates. Stable motion is written as follows in the system of equations corresponding to the lower plane in the system of cylindrical coordinates:

$$\left.\begin{aligned} & u_r \frac{\partial u_r}{\partial t} + \frac{u_\theta}{r}\frac{\partial u_r}{\partial \theta} - \frac{u_\theta^2}{r} = g_r - \frac{1}{\rho}\frac{\partial p}{\partial r} \\ & u_r \frac{\partial u_\theta}{\partial t} + \frac{u_\theta}{r}\frac{\partial u_\theta}{\partial \theta} + \frac{u_r u_\theta}{r} = g_\theta - \frac{1}{\rho r}\frac{\partial p}{\partial \theta} \\ & 0 = -g_z - \frac{1}{\rho}\frac{\partial p}{\partial z} \end{aligned}\right\}$$

To make the above system of equations closed, we use the form of the Continuity equation written in the system of cylindrical coordinates:[2.3]

$$\frac{\partial (r u_r h)}{\partial r} + \frac{\partial (u_\theta h)}{\partial \theta} = 0$$

In the future, the transformation of equations is carried out taking into account the calculation scheme considered in each case.

For example, the current in the horizontal plane along the arc of the circle, when rotated, becomes the following:

$$u_r = 0, g_r = 0$$

Procedia of Theoretical and Applied Sciences
Volume 1, | August 2022
ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

The first equation of the system takes the form below:

$$\frac{u_\theta^2}{r} = \frac{1}{\rho}\frac{\partial p}{\partial r}$$

After joining the second equation of the cisitema to the Bernoulli equation, the equation becomes inverse.Forthe equation remains unchanged:

$$g_z + \frac{1}{\rho}\frac{\partial p}{\partial z} = 0$$

By integrating the last equation, we form the expression below:

$$p = -\rho g z + C$$

We write the effect of atmospheric pressure on the free surface of the current as follows:

$$p = p_{am}, z = z_{\text{пов}}$$

from this:

$$C = p_{am} + \rho g z_{\text{пов}}$$

Or

$$p = p_{am} + \rho g\left(z_{\text{пов}} - z\right)$$

The transformation of equations is carried out in each case, taking into account the calculated calculation scheme of the plots.[4.5.6]

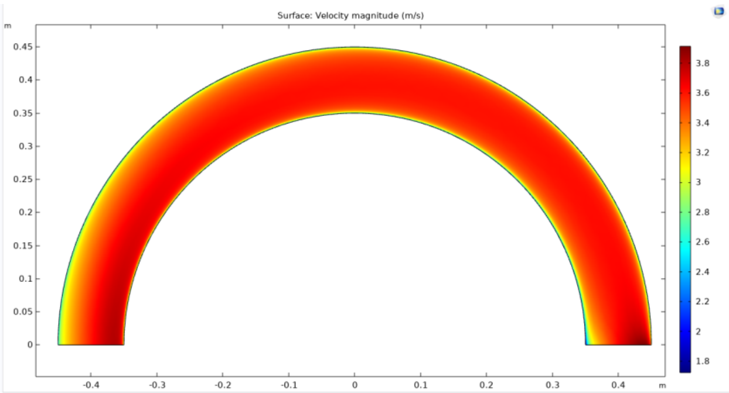

Figure 1 A describes the flow rate and pressure isolines.

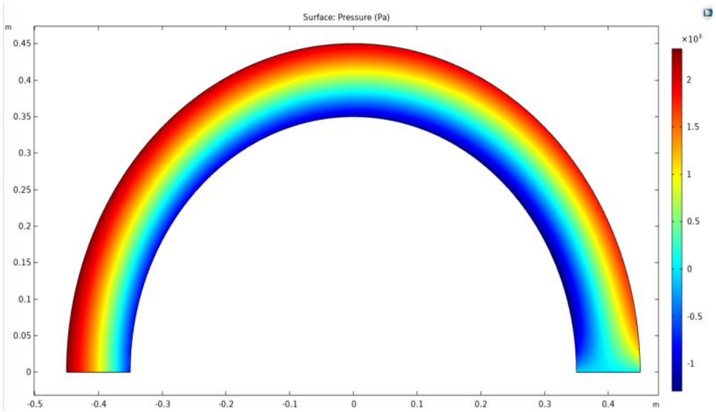

Figure 1 B is the flow rate and pressure isolines.

ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

The figure below shows the pressure distribution along the outer and inner radius of the pipe.

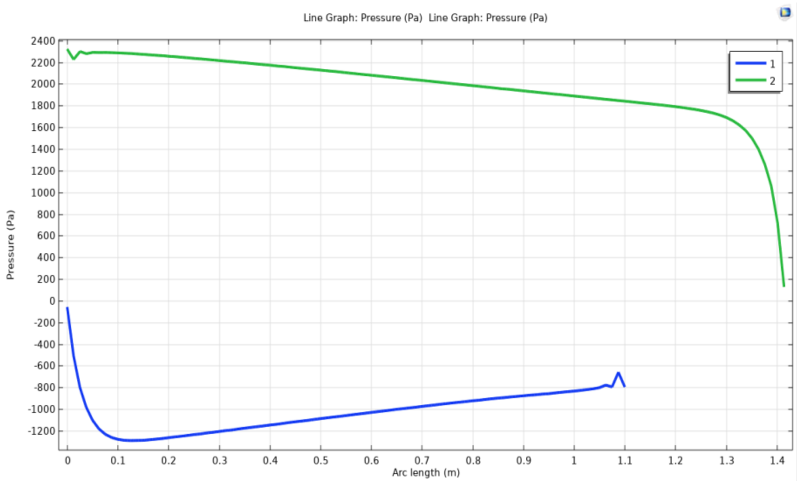

Figure 2. 1) pressure distribution along the inner and 2) outer radius of the pipe.

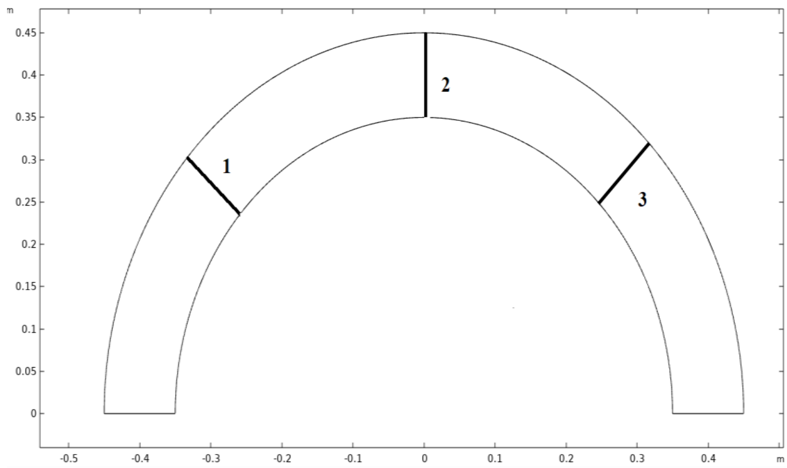

Figure 3 we divide the pipe into 3 sections to study the processes occurring inside the pipe. Figure 4-5 give flow rates and pressure in 3 sections.

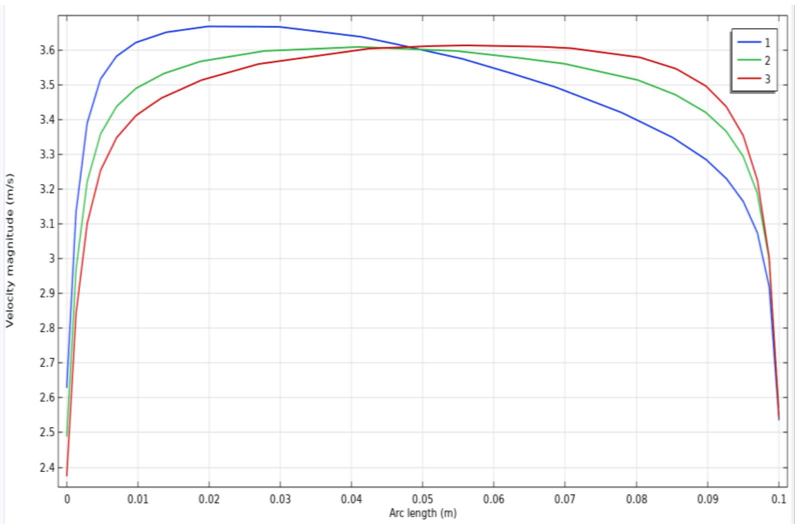

Figure 4. The result of the flow rate in different sections.

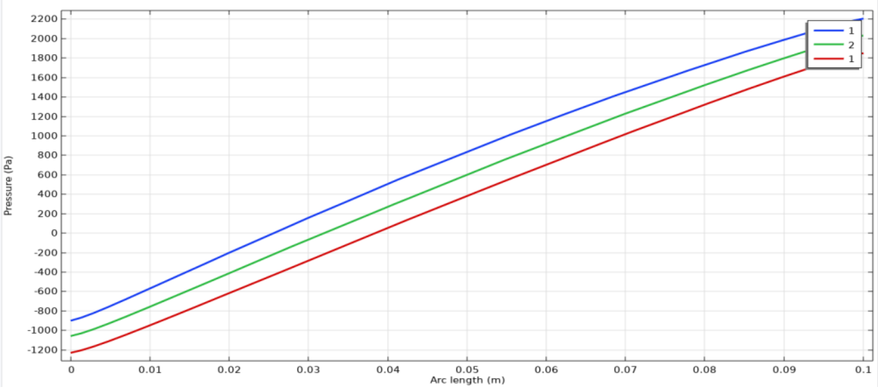

Figure 5. The result of current pressure in different sections.

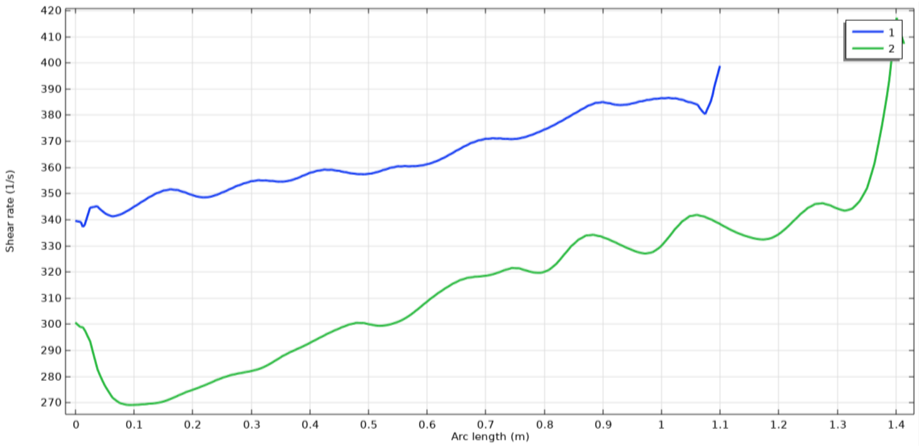

Figure 6. 1) internal and 2) change the koefisient of resistance of the wall along the outer radius of the pipe.

Figure 6 shows the change in the resistance coefisient of the wall along the outer and inner radius of the pipe. $C_f = \frac{2}{\mathrm{Re}}\left(\frac{\partial U}{\partial y}\right)$.

REFERENCES

1. Бегимов У.И. Худайкулов С.И. «Дисперс аралашмалар оқимидаги кавитация ва пульсация жараёнларнинг шаклланиш қонуниятини моделлаштириш ва сув омборларига қўллаш». Монография. 146 б. Бухоро 2019й.
2. Худайкулов С.И., Нишонов Ф.Х. «Математические модели гидравлического удара в гидросооружениях и производственных комплексах» Ташкент - 2017. 146с.
3. Худайкулов, С. И., & Муминов, О. А. У. (2022). МОДЕЛИРОВАНИЯ МАКСИМАЛЬНОЙ СКОРОСТИ ПОТОКА ВЫЗЫВАЮЩЕЙ КАВИТАЦИЮ И РЕЗКОЙ ПЕРЕСТРОЙКИ ПОТОКА. Universum: технические науки, (2-2 (95)), 59-64.
4. Ishankulovich, K. S. (2022). Modeling The Rotation Of A Turbulent Flow With A Variable Radius. International Journal of Progressive Sciences and Technologies, 31(2), 388-395.
5. Абдукаримов, Б. А., Муминов, О. А., & Утбосаров, Ш. Р. (2020). Оптимизация рабочих параметров плоского солнечного воздушного обогревателя. In Приоритетные направления инновационной деятельности в промышленности (pp. 8-11).

Procedia of Theoretical and Applied Sciences
Volume 1, | August 2022
ISSN: 2795-5621 Available: http://procedia.online/index.php/applied/index

6. Мадхадимов, М. М., Абдулхаев, З. Э., & Сатторов, А. Х. (2018). Регулирования работы центробежных насосов с изменением частота вращения. Актуальные научные исследования в современном мире, (12-1), 83-88.
7. Mo'minov, O. A., & O'tbosarov Sh, R. TYPE OF HEATING RADIATORS, PRINCIPLES OF OPERATION AND THEORETICAL ANALYSIS OF THEIR TECHNICAL AND ECONOMIC CHARACTERISTICS.
8. Mo'minov, O. A. O 'tbosarov Sh. R."Theoretical analysis of the ventilation emitters used in low-temperature heat supply systems, and heat production of these emitters" Eurasian journal of academic research, 495-497.
9. Мадрахимов, М. М., & Абдулҳаев, З. Э. (2019). Насос агрегатини ишга туширишда босимли сув узатгичлардаги ўтиш жараёнларини ҳисоблаш усуллари. Фарғона Политехника Институти Илмий–Техника Журнали, 23(3), 56-60.
10. Ugli Mo'minov, O. A., Maqsudov, R. I., & qizi Abdukhalilova, S. B. (2021). Analysis of Convective Finns to Increase the Efficiency of Radiators used in Heating Systems. Middle European Scientific Bulletin, 18, 84-89.
11. Madraximov, M., Yunusaliev, E., Abdulhayev, Z., & Akramov, A. (2021). Suyuqlik va gaz mexanikasi fanidan masalalar to'plami. GlobeEdit.
12. Abobakirovich, A. B., Mo'Minov Oybek Alisher, O. G., & O'G'Li, S. M. A. (2019). Calculation of the thermal performance of a flat solar air heater. Достижения науки и образования, (12 (53)), 9-11.
13. АБДУЛҲАЕВ, З., & МАДРАХИМОВ, М. (2020). Гидротурбиналар ва Насосларда Кавитация Ҳодисаси, Оқибатлари ва Уларни Бартараф Этиш Усуллари. Ўзбекгидроэнергетика" илмий-техник журнали, 4(8), 19-20.
14. Jovliev, O. T., Khujakulova, M. K., Usmonova, N. A., & O'tbosarov, S. R. (2021). Modeling the Theory of Liquid Motion Variable on the Way Flow. Middle European Scientific Bulletin, 18, 455-461.
15. ABDULKHAEV, Z. E., Sattorov, A. M., & Shoev, M. A. O. (2021). Protection of Fergana City from Groundwater. Euro Afro Studies International Journal, 6, 70-81.
16. Худайкулов, С. И., Жовлиев, У. Т., Сайлиев, О. И., & Утбосаров, Ш. Р. (2022). МОДЕЛИРОВАНИЯ ЗАДАЧИ ТУРБУЛЕНТНОГО ТЕЧЕНИЯ СМЕСИ ВЯЗКИХ ЖИДКОСТЕЙ. BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI, 2(1), 405-410.
17. Ishankulovich, K. S., & Akramovna, U. N. (2021). Simulation of the Lift of Two Sequential Gate Valves of the Karkidon Reservoir. Middle European Scientific Bulletin, 18, 148-156.
18. Abdulkhaev, Z. E., Abdurazaqov, A. M., & Sattorov, A. M. (2021). Calculation of the Transition Processes in the Pressurized Water Pipes at the Start of the Pump Unit. JournalNX, 7(05), 285-291.
19. Abobakirovich, A. B. (2019). O'Gli Mo'Minov Oybek Alisher, and Shoyev Mardonjon Ahmadjon O'G'Li.". Calculation of the thermal performance of a flat solar air heater." Достижения науки и образования, 12(53), 2022.