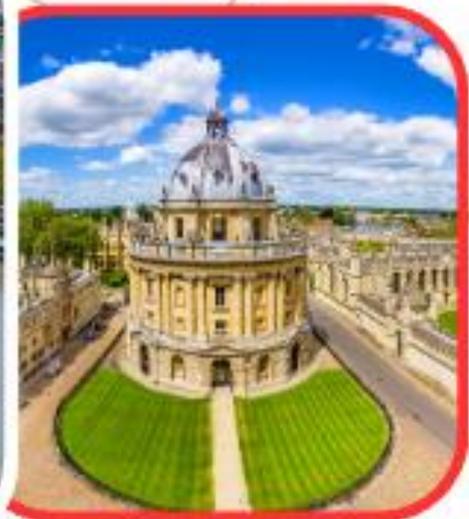




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Gidravlik bosim yo'qolishini hisoblovchi formulalar.

Shamsutdinov.B.F

Farg'ona davlat texnika universiteti.

Neft va gazni qayta ishlash kafedrası dotsenti.

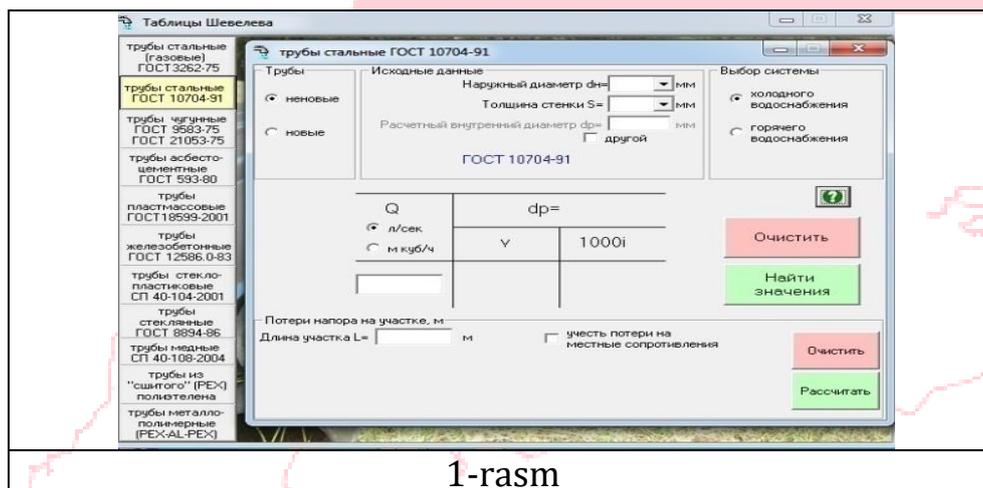
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Annatsiya: Ushbu maqolada gidravlik bosim yo'qolishini aniqlashning analitik usul, tajriba usuli va Shevelev dasturlaridan foydalanib, bosim yo'qolishi hisoblab chiqildi va ularni qanday aniqlikda ishlashini tekshirish uchun nisbiy xatolik foizi topildi. Bu maqolada nisbiy xatoligi kam bo'lgan usul bizga bosim yo'qolishini aniqlashda aniqroq natija berishi mumkinligini isbotlaydi.

Kalit so'zlar: Bosim yo'qolish analitik usul, laminar, Shevelev dasturi, tajriba usuli, gidravlik qarshilik koeffitsenti, trubulent,

Kirish. Bosim yo'qolishi suyuqlik energiyasining pasayishiga aytiladi. Bosim yo'qolishini hisoblash Renold soniga asoslangan bo'lib, u qovushqoqlik hamda suyuqlik yoki suvning zichligiga quvurning tuzilishiga va quvur ichki yuzasini ishqalanish kuchiga bog'liq. (Ivanov & Petrov, 2017). Quvurdagi bosimning yo'qolishi aniqlash quvurlarni va nasoslarni tanlash uchun muhim omil hisoblanadi. Quvur ichida bosim yo'qolishini aniqlash bir qancha usuli bo'lib ularning afzalliklari va kamchiliklari keltirilgan.[Vladimir Savic 1, - Darko Knezevic 2 - Darko Lovrec 3 - Mitar Jovanovic 1 - Velibor Karanovic 2009].

1- Shevelev dasturidan foydalanib bosim yo'qolishini aniqlash Bu dastur(1-rasm)dan foydalanib bosim yo'qolishini hisoblash uchun sarf (Q) ni topish kerak.



1-rasm

Bu dastur bosim yo'qolishini (1) formula yordamida hisoblaydi.

$$Q = V \omega \quad (1)$$

bu formuladan foydalanish uchun (2) formulani keltirib chiqaramiz.





$$Q = V \frac{\pi d^2}{4} \quad (2)$$

Analtik usul yordamida bosim yo'qolishini hisoblash (3) formuladan foydalaniladi.

$$h_m = \lambda \frac{l}{d} \frac{v^2}{2g} \quad (3)$$

h_m -bosim yo'qolishi, v -tezlik, λ -mahalliy qarshilik koefitsenti, d -diometr, (3)- formuladan foydalanganda λ qiymatini topish kerak. λ ni topish formulasi laminar va trubulent oqimlarda turlicha bo'ladi.

Laminar Re soni <2000 oqimlarda λ topish formulasi.

$$\lambda = \frac{64}{Re} \quad (4)$$

Re-Renold soni.

Trubulent oqimlarda Re soniga ko'ra 3xil xisoblash fo'rmulasi bo'lib, Renold soni $4000 < Re < 10d/\Delta_3$ ga teng bo'lganda gidravlik qarshilik koefitsenti (5) formulada topiladi.

Formula: Blaziusa
$$\lambda_T = \frac{0.3164}{Re^{0.25}} \quad (5)$$

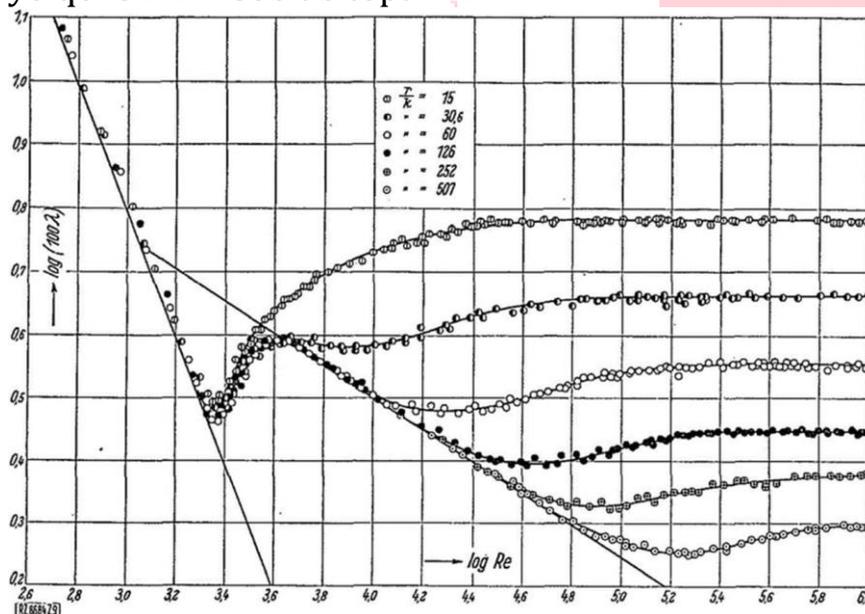
Renold soni $10d/\Delta_3 < Re < 560d/\Delta_3$ oraliqda bo'lganda λ (6) formula bilan topiladi.

Formula: Altshul
$$\lambda = 0.11 \frac{\Delta_3}{d} \frac{68}{Re^{0.25}} \quad (6)$$

Renold soni $Re > 560d/\Delta_3$ bo'lsa (7) Altshul formulasiyan foydalanamiz.

Formula: Altshul
$$\lambda_T = 0.11 (\Delta_3/d)^{0.25} \quad (7)$$

3-Tajriba usuli yordamida bosim yo'qolishini aniqlash. Nikuratz grafigi yordamida λ qiymatini aniqlab olamiz va (3) formula asosida bosim yo'qolishini xisoblab topamiz.



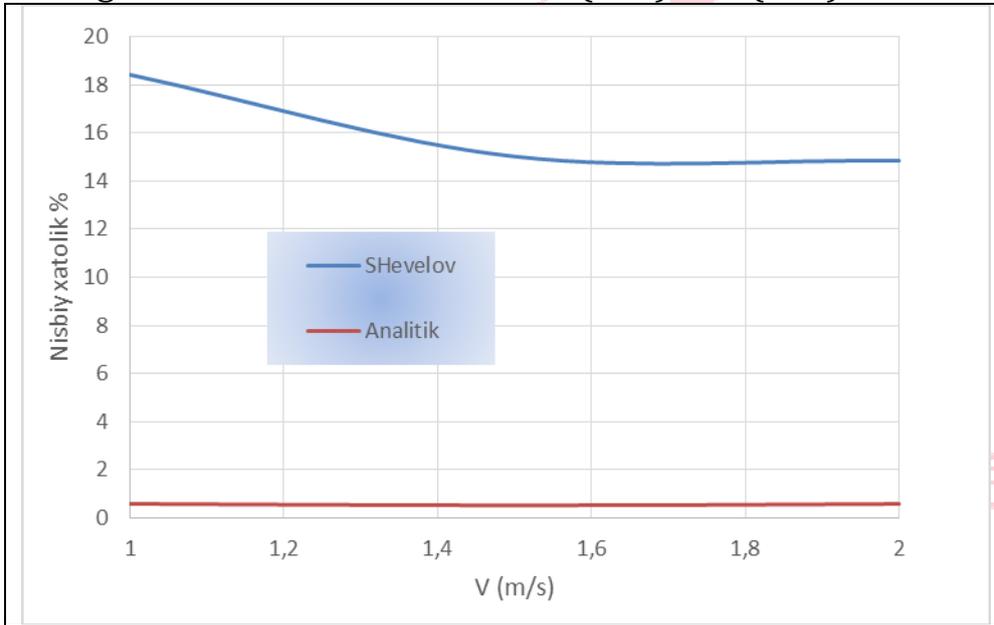
Yuqoridagi usullar bilan tanishib chiqish uchun masaladan foydalanamiz.



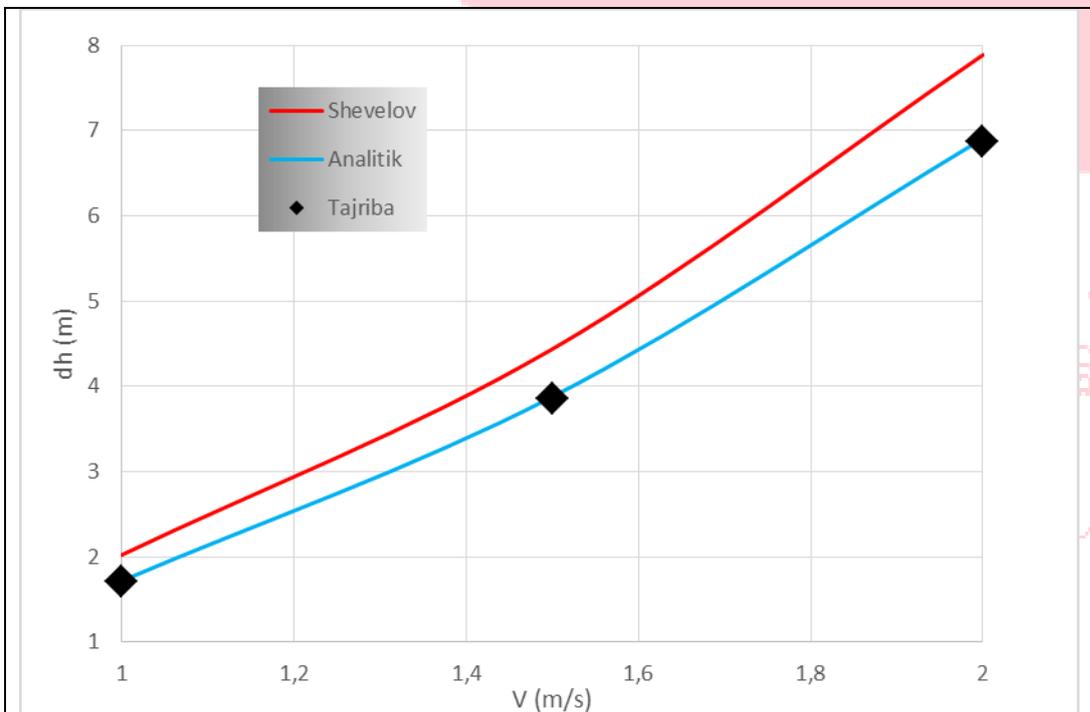


1-masala: 3ta bir xil quvur ichidagi turli tezlikda harakatlanayotgan suv bosimining yo'qolishi qanday topiladi? 1-masala yechimini Shevelov dasturi va analitik usuldan foydalanib hisoblab ko'ramiz va bu usullarni qanchalik aniqlikda ishlashini bilish uchun nisbiy xatoliklarini topamiz.

Berilgan: $v_1=1, v_2=1.5, v_3=2, D=110(\text{mm}) \Delta=1(\text{mm}), L=100\text{m}$

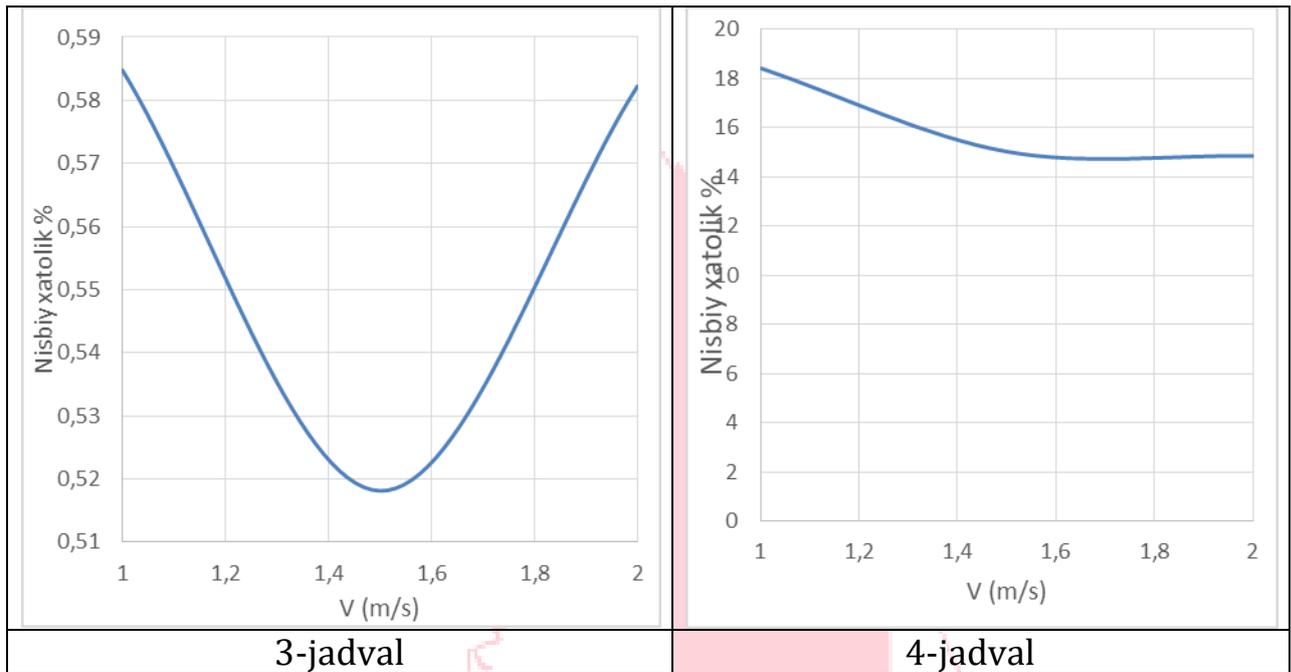


1-jadval



2-jadval





Analitik usulda bosim yo'qolishi hisoblanilganda nisbiy xatolik foizi juda kam bo'ladi va tajriba bilan deyarli ustma-ust tushdi(2-jadval) Analitik usulda bosim yo'qolishida tezilikka bog'liq o'zgarishi (3-jadval), Shevelev dasturida olingan natijada bosim yo'qolishini qanday o'zgarishi (4-jadval) da tasvirlangan.

Xulosa: Yuqoridagi masalaning yechimlaridan ko'rinib turibdiki analitik usul yordamida bosim yo'qolishi topilganda nisbiy xatolik foizi kamroq bo'lishi mumkin.

Minadorchilik: Farg'ona davlat texnika universiteti arxitektura va qurilish fakulteti DSc M.Madaliyevga maqola yozishda yordan berganligi uchun o'z minadorchiligimni bildiraman.

Foydalanilgan adabiyotlar:

1 Averkova, O. A., Logachev, I. N., & Logachev, K. I. (2012).

2 Моделирование отрыва потока на входе во всасывающие каналы в областях с разрезами. Вычислительные методы и программирование, 13, 298-306.

3 White, F.M. – "Fluid Mechanics". Kundu, P.K., Cohen, I.M., Dowling, D.R. – "Fluid Mechanics"

4(Ivanov & Petrov, 2017).

5.[Vladimir Savic 1, - Darko Knezevic 2 - Darko Lovrec 3 - Mitar Jocanovic 1 - Velibor Karanovic 2009].

