ausgabe
7+8

energy Jwasser-praxis

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LNG für Europa

Grid Telecontrol technology Monitoring and control of energy transmission grids

Pipes | Materials Test limits for water pipes made of PE pipes

Corrosion | Field test Influence limit values for AC corrosion

Efficient cleaning of water distribution networks

In contrast to rinsing with water, the Campax cleaning system uses water sparingly and achieves an effective cleaning performance thanks to the air moles (Fig. 1). In the set for washing ssr rinsing, where continuous 0ineturbulen- te flow from impurities and deposits, the flow velocity changes during Cornprax cleaning depending on the air pulses.

Figure 1 shows the pressure curve während einer Comprex-Reinigung darge- Slollt [1]. Two pressure sensors positioned at different distances are used to measure the pressures. Due to the puf-

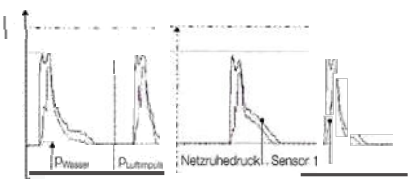
Condition	Flow (speed profile	Remarks
In operation v < 1 mis		laminar flow v_{min} = 0
Wasserspülung v = 2 m/s bis 3 m/s		turbulent flow vg = 1/2 vg
Gomprex cleaning in Spülabschnitt v: depending on Pressure curve v0r flushing waste v: D.2 rri/s to 0.8 mis		WQSsOrphase laminar/turbulent Flow v(--): variable Phase boundary turbulent flow v(0): 10 rn/s to 15 rn/s

Fig. 1 Model representation of b& Bairieb, water flushing and complex cleaning of a pipeline

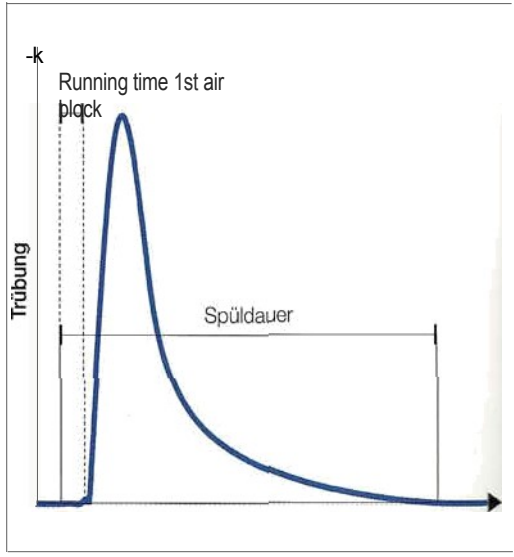


Fig. 2: Preliminary turbidity curve during complex cleaning

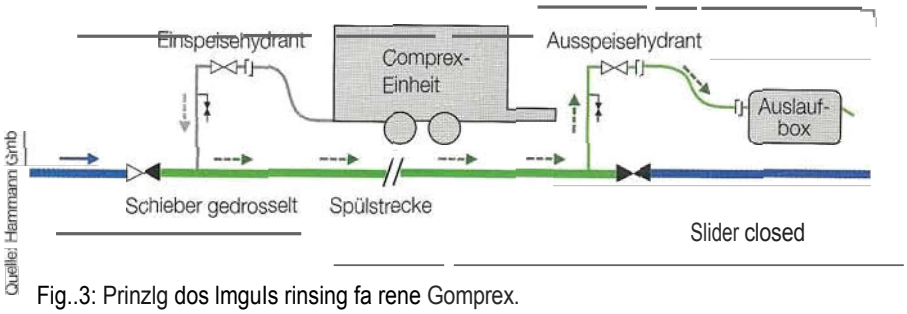


Fig..3: Prinzlg dos Imguls rinsing fa rene Gomprex.

The effect of air bubbles already present in the pipe (air pigs) is reflected in the flow velocity of the water bubbles. The water enters the rinsing chamber at flow velocities < 1 mts and has a linear flow. The \WBSSsrbtócke are accelerated by air ilTtQUtg6. In the water/air/ pipe wall boundary areas, turbulence forms with Niel3 velocities of 10 m/s to 15 m/s. The iMermitt The moderate velocities induce an extremely intense drag stress. The turbulence at the phase boundaries between the water and airb cause further controlled cavitation. Impurities and deposits are mobilized.

The discharge of V6runreir g rgen can be followed on the basis of the turbidity of the rinse water. Figure 2 shows the principle course of the turbidity during a Com- prex-Rainigurq. The turbidity curve tends to correspond approximately to the discharge of biofilm. This means that no more biofilm is discharged when the rinsing water is clear and the pipe can be described as clean.

The Comprex impulse flushing method is based on the controlled, impulse addition of compressed, quadruple-filtered air from a Comprex unit into a defined flushing section (Fig. 4). Based on the parameters Ner\nwaite of the pipe, length and course of the flushing section and pipe network rest pressure, the pipe network pressure is lowered and the impulse pressure of the air is adjusted to the pipe rest pressure. The air blocks that form at the feed point move alternately with water blocks through the flushing section. Mobilizable deposits are ejected from the pipe walls and carried out with the flushing water.

Due to the impulse pressure below the resting pressure I, the pipe system is not exposed to higher pressure loads than in normal operation. Damage is therefore excluded. DE Air bubbles in the Comprem process can be considered air bubbles. They fit adapt to the pipe cross-section and do not get stuck. Different tJannwaten or even branches are no problem. Compared to conventional pigging technology, the simplicity of the Comprex process is impressive. Using connections such as hydrants or aeration and deaerating vents, the pigs can be produced with computer-aided seeding based on pipe parar- ters and the addition of0 Vi' purified air. In deaerators, hydrants are normally used to expel the rinsing water.

As the \ Te-Spk\ years with time-limited flushing in previously defined LBitungsabschnitte with low

If the water supply works, the rest of the supply network remains unaffected. Only in the sections of the line to be flushed may no water be drawn by residents.

Literature

[1] Harding K.: IKT-Report Dazember 2006: Abwas- serdruckl4ilities, possibilities and procedures zur Reinigur'g S, 83,

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