



INNOVATIVE TECHNIQUE AND TECHNOLOGY FOR THE RECONSTRUCTION OF GAS WELLS WITHOUT DAMPING THEM WITH THEIR SUBSEQUENT OPERATION IN CONCENTRIC LIFT COLUMNS

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ABSTRACT

This paper discusses an innovative technology for operating wells in concentric tubing strings using a special automatic well control and management system after its reconstruction without killing, which allows not to replace the tubing until the end of the well's service life.

Introduction. The flow rate of gas and gas condensate wells is constrained by a variety of issues when developing gas and gas condensate fields. Well productivity is harmed as a result of these difficulties encountered during the operation of gas and gas condensate wells.

Literature review. The functioning of gas and gas condensate wells has been the subject of extensive scientific study. The study helps experts like Amiyan V.A., Vasilyeva N.P., Ibragimov J. X., Datsyuk I.O., Gileb T. V., Verisokin A. E., Mirzajanzade A.H., Kuznetsov O.L., Basniev K.S., and

Aliyev Z.S. resolve problems with the operation of gas and gas condensate.

Research methodology. Water and gas condensate may build up at the bottom of gas wells while they operate, reducing the productivity of the well. The inability of the gas flow to completely remove the liquid from the hole has led to an accumulation of liquid at the bottom of the well [1, 2, 3]. The selection of the liquid removal technique is supported by a number of factors, including the formation's geological and geophysical features, its operational history, the well's design, the caliber of the cement stone used behind the



column, and the purpose of the water intake [4, 5]. By providing a higher upward gas flow velocity and its constant evacuation by swapping the elevator column with pipes of smaller diameter, it is feasible to avoid the accumulation of condensation water at the bottom. This approach, however, takes a lot of time and money [6, 7].

The methods of well operation at gas velocities that assure the removal of liquid from the bottom, plunger elevator installations of various modifications, and physicochemical methods of periodic and continuous liquid removal have found the largest applicability in field circumstances [8, 9].

A successful application of the technology of well operation using concentric elevator columns using a special automatic well monitoring and control system after its reconstruction without damping, allowing not to replace the pump and compressor

pipe until the end of the well service, was developed and carried out in conditions of depletion of reservoir energy and gas reserves and accumulation of liquid at the bottom for further operation of gas wells. analysis and conclusions. Up until now, replacing elevator pipes with pipes of a lower diameter has been the primary solution to the issue of liquid collection at the bottom of flooded wells. However, if an additional elevator column is implemented without requiring extensive repairs or well jams, its efficiency may be much better. To achieve this, polymer reinforced pipes and the technology for their single-segment descent under pressure without quieting the well have been developed. Additionally, the mobile complex MKRS-20 has been built and has undergone successful factory and laboratory tests. In compared to steel, polymer pipes have the following benefits: (picture 1.)

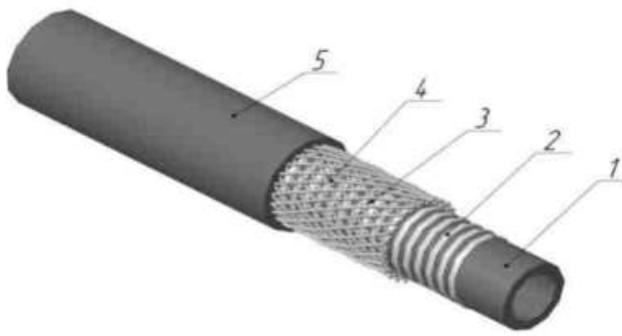
Advantages of polymer pipelines

Long service life (50-100 years)	Possibility of pipe production in segments up to 2000 m
High resistance to many aggressive environments	A small number of joints or their absence when installing pipes
Low adhesive properties of the polymer	Good thermal insulation properties
High reliability in case of mechanical overload due to such properties of polyethylene as viscosity and elasticity at the same time	High hydrodynamic characteristics due to the low roughness of the polyethylene pipe surface
The weight of polyethylene pipes is 2-4 times less than steel	Simplicity and cheapness of polyethylene butt welding of pipes

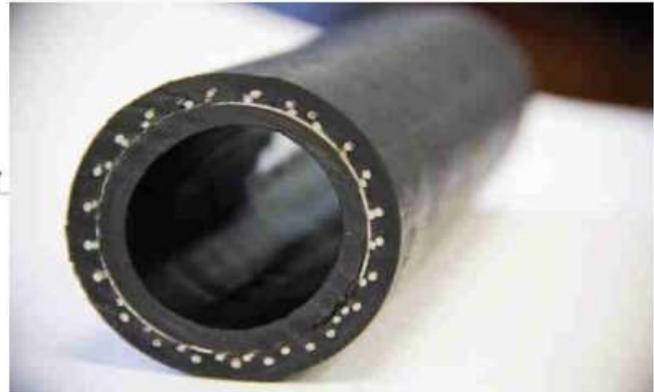
The main benefits of polymer pipes over steel are shown in Picture 1.

The polymer reinforced pipe TG19/73-10/10-75 with a steel belt with a certain

pitch was developed based on the technical specifications developed for a polymer reinforced pipe as a concentric elevator column [10, 11] for gas wells.



a)



b)

Figure-2. Polymer reinforced pipe TG19/73-10/10-75: a) pipe construction: 1 – internal polymer pipe; 2 – transverse reinforcement;

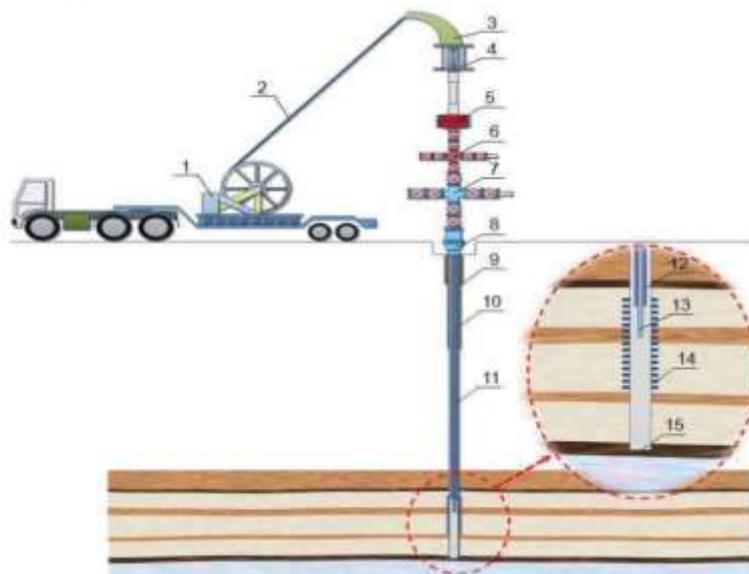
3, 4 – armor midwife (left, right); 5 – outer shell; b) photo of the pipe

The internal polymer pipe of the TG19/73-10/10-75 pipe serves as a direct hydraulic route for conveying gas and liquid. Transverse reinforcement is the primary component that senses the radial load (internal pressure). To obtain a combination of high pipe flexibility properties at maximum internal pressure, it is structurally a high-strength steel tape layered with a particular pitch. High-carbon steel armor coils coiled in the opposite direction are applied to assure the

needed amount of breaking force. An exterior shell constructed of polymer material shields the reinforcement from corrosion.

A complex of tools known as MKRS-20 was created in tandem with the development of the TG19/73-10/10-75 pipe in order to use it in the technology of a concentric elevator. It consists of the following tools: a pipe holder for CLK; a 4-spot preventer with a working pressure of 21 MPa; a 2-chamber sealer with a working pressure of 14 MPa; an injector (feeder); a tower for mounting the injector; and receiving

Picture 3 depicts the schematic for the gas well equipment with a concentric lift column.





Picture 3. Diagram of the well equipment with a concentric lift column: 1–receiving and giving device with a drum; 2–flexible steel polymer pipe; 3–guide chute; 4–injector; 5–block of preventers; 6,7–fountain fittings; 8–column head; 9–direction; 10–conductor; 11–operational column; 12–tubing; 13–steel polymer pipe

(SPT); 14–perforation interval; 15–artificial face

Conclusions and suggestions. Concentric lift technology will be used to ensure stable operation of the well and prevent technological meltdowns. The application of KLK technology seems promising in the late and final stages of field development.

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