

## **FEATURES OF APPLYING OF AIR-LIFTS FOR DRAINAGE OF MINE SHAFTS**

Atroshenko D.I., student,  
Ignatov A.V., candidate of technical sciences,  
Donetsk National Technical University

*The results of studies of application of air-lifts for drainage of mine shafts are reviewed*

The air-lifts of different output are applied:

- 1) For feeding fissile circulating slime and hoisting of waste fluid on small altitude on sewer refining buildings;
- 2) For feeding chemical reagents on water refining buildings;
- 3) For water delivery from wells;
- 4) The most relevant branch of applying of air-lifts is oil producing.

The expertise has shown, that alongside with essential (boring of shafts, hoisting of solid materials) deficiencies (rather small efficiency, impossibility of hoisting of fluid from a shallow depth), the air-lifts have a series of virtues, which one are most appreciable at exploitation on refining buildings:

- Simplicity of the device;
- Absence of moving parts;
- The contents of suspended matter in a unrestricted amount in heli-portable fluid is admissible;
- The power source is served by(with) compressed air.

The diversity of schematic and design solutions of air-lifts allows to utilize them in miscellaneous branches of production.

The magnification of a coal mining requires demands creation of following conditions of a ventilation of mine developments, that, in turn, results in necessity of conducting of the increasing number of mine air shafts.

The know-how of a building of mine shafts by a boring method envisions after closing -up on their attachment pumpdown of flush fluid for quality check of a support and supply of safe operations on break-through of shaft with mine developments.

Thus, the periods of placing on production of air shafts essentially depend on time of their desaturation and the problem of determination of the optimal technological schemas their desaturation is actual.

The air-lifts requires smaller expenditures of time on mounting and наладочные of operation, are more simple and are reliable as contrasted to by pumps, but have smaller boiler efficiency, which one in accordance with bailing from shaft is slashed and can achieve 10 %.

Actual is the problem of determination of a possible range of application of air-lifts for desaturation of air shafts.

For applying a possibility of effective pumping of shafts of different depth through air-lifts the accounts of the account performances of air-lifts for following input datas are executed: depth of shaft  $H_c = 100 \dots 500$  m; diameter of hoisting of a tube  $d_{\pi} = 0,129; 0,2; 0,33$  m; geometrical submergence of the mixer  $h = 10 \dots 100$  m, altitude водоподъема  $H = 0 \dots 500$  m.

The analysis of accounts demonstrates, what at depth of shaft 100 m and diameter of the pipe line 0,129 m pumping at air consumption is more 0,4 m<sup>3</sup> /with is inexpedient, as for all duties in this case efficiency is less 0,15; it is possible effectively to pump off shafts by altitude up to 400 m at usage of tubes with an inside diameter 0,129 ... 0,200 m and depth up to 200 m - for tubes a dia of 0,33 m.