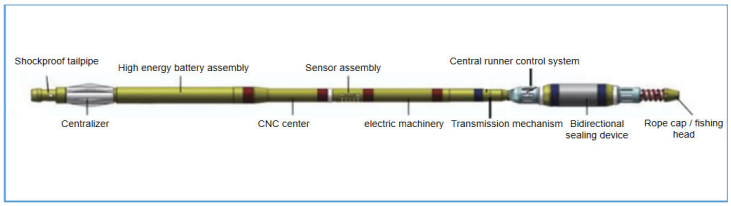
Downhole Intelligent Robot Drainage And Gas Production Technology

The downhole intelligent robot is a combination of artificial intelligence and mechanical structure. It has the functions of intelligent drainage and cordless logging. The robot is equipped with a variety of sensors to deeply integrate information technologies such as perception, acquisition, storage, calculation, control and communication. According to the pre-programmed program, the robot is put into the well. After the robot detects the liquid level position of the wellbore, it sinks to a certain depth of the apparent liquid level, and completes the intelligent drainage from top to bottom, by stages and sections, and back and forth periodically. During the drainage process, the dynamic liquid level position of the wellbore can be automatically tracked, and the drainage volume is controlled by software. In the ideal state, the drainage and production balance of a single well can be achieved, Maximizing gas well productivity under a reasonable working system. At the same time, the wellbore and formation test data are collected. The ground staff can use digital software to establish multiple intelligent operation management systems such as intelligent drainage, dynamic monitoring, production management and remote monitoring of the whole oil and gas block.

Principle of work

- Combination of mechanical structure and artificial intelligence;
- Descending: the central flow channel is automatically opened, oil, gas and water are unobstructed, and the robot slowly descends with its weight;
- Ascending: the central flow channel is controlled and closed, the air-water channel is closed, the bladder is inflated and expanded, the energy storage and pressurization at the lower part of the bladder, the robot is pushed upward, and the reciprocating cycle is used for quantitative drainage;
- In the process of up and down operation, the sensor collects data such as wellbore and formation pressure and temperature, and automatically controls the operating parameters of the robot through intelligent calculation of the numerical control center.



Technological Superiority

- There is no need to modify the wellhead process and the installation is simple;
- Automatic and continuous drainage can be realized without opening and closing the well;