

Applications of New Technologies in the Oil Industry

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Abstract

With the rapid development of science and technology, the rapid development of high and new technology and its industry, represented by information technology, biotechnology, new material technology, has a profound impact on the political, economic, military, cultural and other aspects of the countries. In the increasingly fierce comprehensive national strength competition with economic strength, national defense strength and national cohesion as the main content, whether to occupy a place in the high-tech has become the focus of competition. The history of oil industry for more than 100 years is also a history of science and technology.

Keywords

New technology; Oil; Development; Application.

1. Introduction

Science and technology is the engine of human progress. The development history of modern social productive forces is also the history of the mutual promotion of scientific development concept, technological revolution and industrial revolution. The high and new technology is of epoch-making significance. In the 21st century, high and new technologies, mainly represented by information technology, biotechnology, life science, new material technology and new energy technology, will develop rapidly. The oil industry will face severe challenges and more development opportunities.

2. New Technology

Science and technology is the first productive force, and constantly develop new technology, is the only way for countries to realize national rejuvenation, along with the reform and opening up and further development of our country science and technology, all kinds of high and new technology have emerged, new technology of a country or a region's political, economic, and military and so on have significant influence on all aspects of progress, and can form the industry's advanced technology group. This paper mainly introduces the application and prospect of information technology, bioengineering technology, new material technology, nanotechnology, new energy and renewable energy technology in oil industry.

3. Information Technology

3.1. The Role of Information Technology in the Oil Industry

In the era of knowledge economy, the development of high-tech led by information technology has brought profound changes to the oil industry, and many new information technologies have emerged in recent years [1].

1. Development strategy of information technology foreign advanced oil companies generally attach importance to the construction of company information, and can determine the goal of company information construction according to the development process of world information technology

2. The development of computer network technology has greatly promoted the business development and management improvement of oil companies. The network has accelerated the realization of all kinds of remote operations, made it possible to transmit real-time data in different places, promoted the trend of global economic integration, generated a variety of "virtual organizations", and various oil companies have accelerated the construction of their information base.

3. 3d visualization and vr technology with the continuous progress of vr technology, 3d visualization of geoscience data has become a very important geoscience tool, which can explain work more quickly and accurately, and data visualization in the virtual environment represents the future development direction of such tools.

4. The data of exploration and development is the lifeblood of oil companies and the precious wealth of oil companies. Because of the large amount and complex types of exploration data, it is difficult to manage and utilize them. The development of information technology makes it possible to manage these data effectively.

5. The application of geographic information system (gis) in petroleum industry lags far behind that of urban planning and environmental protection. With the strengthening of data work of oil companies, the application of geographic information system (gis) in oil industry is more and more extensive.

6. With the popularization of information technology in the petroleum industry, the trend of networking, visualization, integration and intelligentization has emerged.

Domestic oil industry development track of the application and development of information technology and foreign basic same, although China's oil industry the development and application of information technology has reached a considerable level, but with foreign oil companies in information technology have a certain gap, we as university of petroleum reserve, so we must learn more of the information technology, master certain information technology foundation.

3.2. Problems in the Construction of Petroleum Industry Informatization

Due to the unified planning and guidance of petroleum enterprises and the disunity of the superior leaders of various departments, some problems in the informatization of petroleum industry are mainly the low utilization rate of various resources and the disordered management

1. Low resource utilization and lack of unified planning and guidance, and various data cannot be timely Shared. Software development platform is not unified, software development and use disorder.

2. Management chaos as it is mainly led by leaders, with the development of the oil industry, it is necessary to change the way of leadership in the past

3. Lack of scientific research support because the personnel with relevant software development are concentrated in a few places such as research institutes and petroleum universities, and the number of personnel is limited and uneven.

4. Biotechnology

4.1. Application of Bioengineering Technology in Petroleum Industry

Bioengineering technology has been applied in the petroleum industry as early as the 1920s, such as bacterial oil recovery and biological desulfurization. With the development of modern bioengineering technology, biotechnology has penetrated into all fields of petroleum industry [2].

1. Microbial exploration technology is an exploration technology that directly seeks oil and gas reservoirs through microorganisms. This technology can be used to reveal the underground gas content, and can be used as a pre-exploration for other high-cost exploration, so as to reduce exploration risks and costs and reduce the probability of dry Wells
2. Microbial oil recovery technology microbial oil recovery, also known as bacterial oil recovery, has the advantages of low cost, easy construction and no pollution. Some bacteria metabolize surfactants that reduce oil viscosity and increase oil fluidity
3. The use of microorganisms in oil pollution treatment can clean up the oil pipe and control the oil and sewage on the ground. It can save 50-70% of the cost compared with traditional methods.

4.2. Application of Bioengineering Technology in China's Petroleum Industry

Bioengineering technology is also widely used in China's oil industry, such as microbial exploration technology, microbial oil recovery technology, microbial sewage treatment. All these technologies have made a certain contribution to China's oil industry, but on the whole, compared with developed countries, China's biotechnology in the oil industry research and application, whether in the upstream or downstream there is a big gap. Bioengineering technology can be expected to have an increasing impact on the future of the oil industry.

5. Nanotechnology

5.1. Application of Nanotechnology in Petroleum Industry

In the 21st century, the combination of nanotechnology and traditional technology will bring broad prospects to the oil industry. The outstanding charm of nanotechnology is reflected in the improvement of traditional products, which can greatly reduce costs and have better material properties [3-4].

- 1 nanometer plastic nanometer plastic generally refers to the organic-inorganic nanocomposite materials formed by inorganic fillers dispersed in the organic polymer matrix in nanometer size. Compared with ordinary materials, nanometer plastic has higher mechanical properties and thermal properties, and can improve the dimensional stability of materials
2. The applications of synthetic fiber nanocomposites mainly in the textile industry show great prospects. These materials with various excellent properties have been applied to many aspects of petroleum
3. Due to the small size and large area of nano-particles, the bonding state and electronic state on the surface of the catalyst are different from that inside the particles, and the coordination of atoms on the surface is incomplete, which leads to the increase of active sites on the surface. It can be a good catalyst for desulfurization of petroleum
4. In recent years, the design and synthesis of nanometer coating materials is one of the hot topics in materials science

5.2. Application of Nanotechnology in China's Oil Industry

The application of nanotechnology in China's petroleum industry is still in its infancy. Nanotechnology, which is closely related to the oil industry, focuses on the design and manufacture of nanomaterials. Although a great deal of research has been carried out, the real industrial application is not very common. There are two main categories of research work. One is nanomaterials from the oil and gas industry. The second is nanomaterials that serve oil and gas. The former mainly includes polymer-inorganic nanocomposites and carbon nanomaterials. The latter includes new catalyst materials related to nanotechnology, nanomaterials needed in petroleum development, nano-solid particle additives for oil products, etc. However, there are the following problems in the application of nanotechnology in the oil industry:

1. There are many reports on nanomaterials, but the real research is still superficial.

2. Nanotechnology is still in the stage of powder preparation, and due to the high price of powder, it has lost its application value in the oil industry
3. In the oil industry, only the application of nanotechnology is emphasized, while the evaluation of the effect, the identification of the properties of nanocomposites and the detection of the real nano effect are ignored. There are some things out of reality, such as the desire for quick success and quick benefit or the blind pursuit of high precision
4. Ignoring the technological support, scattered and small-scale production can be seen everywhere, and various products with the name of "nanomaterial" have appeared

6. New Energy and Renewable Energy

6.1. Development Status of New Energy and Renewable Energy

Research on the development of new energy and renewable energy at home and abroad, especially the development of new energy related to the oil industry, resources distribution and resources, and in the coming decades of renewable energy, which is the development trend of future research emphasis, introduces below the geothermal energy, fuel cell and gas hydrate more close relationship with the oil industry, the application of the new energy [5].

1. Geothermal energy geothermal energy originates from the molten magma of the earth and the decay of radioactive material. The deep circulation of groundwater and magma from the very deep intrudes into the crust, bringing heat from deep underground to the surface. At present, a set of relatively complete technical methods and evaluation methods for geothermal exploration have been established in China. However, as a new industry related system has not been improved, the system of technical regulations, norms and technical standards are not perfect and perfect.
2. Fuel cell fuel cell is a new form of energy production, which converts chemical energy into low-voltage direct current energy through electrochemical reaction. Because the product of battery reaction is only water, it does not pollute the environment. While fuel cells have made progress in electric cars, submarines and other fields, there is still a long way to go before these technologies are commercially available and many key technical issues need to be resolved.
3. Natural gas hydrate is an ice-like, non-stoichiometric, cage-shaped crystalline compound composed of water and natural gas under certain conditions. Natural gas hydrate (NGH) is a promising new energy resource in China.
4. Other new energy sources mainly include solar energy, hydrogen energy, biomass energy and Marine energy. But these energy sources are in the research and development, not widespread, mainly because the technology is not mature enough.

6.2. Influence of New Energy on Oil Industry

With the increase of global demand for green energy, countries have gradually adjusted their energy structure, and the proportion of new energy has gradually increased, which has put forward higher environmental requirements for petrochemical products. At the same time, the application of new energy will bring new development opportunities for oil companies. China should also accelerate the development of new energy, to open up a new path for the harmony between energy and the environment, the major oil companies through the diversification of energy development, to avoid the risk of oil crisis. Sustainable development of energy can be realized by finding new energy sources [6-7].

7. Conclusion

The society of 21 centuries is an information technology and high and new technology are very developed society. With the progress and development of modern society, especially the wide

application of high and new technology in all walks of life. Future research and long-term technology outlook are becoming more and more important for national and multinational enterprises to formulate science and technology policies, and various new technologies will continue to emerge. We should also actively study new and high technologies and apply new and high technologies to the oil industry on the basis of learning professional knowledge.

References

- [1] Li Chunjie, Li Dan, and Lu Lu. Monographic Research on information technology, Jilin University Press, May 2012.
- [2] He Xiaoxian. Science Press, introduction to modern bioengineering, 21st century higher education textbooks, 2005.9.
- [3] Zhai Qingzhou, Nanotechnology, Ordnance Industry Press, 2006.3.
- [4] Du Bin, Nanotechnology, Ordnance Industry Press, 2005.12.
- [5] Zhang Zhijun. New Energy, Science Press, 2010.
- [6] Li Wanping. Research on the potential influence of new and renewable energy on petroleum industry. 2003..
- [7] Liu Zhenwu. The application of high and new technology in petroleum industry. Petroleum Industry Press, 2003.7.