Application of Fine Management in Polymer Injection Quality in Oilfield

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Abstract. The implementation of polymer injection in oilfield has a very important impact on oilfield exploitation, which is related to oilfield exploitation efficiency and oil quality to a certain extent. In this paper, the refined management method in oilfield polymer injection work is analyzed and studied, and the important role of refined management concept and its application in oilfield polymer injection process is briefly expounded. Taking SL oilfield as an example, the specific application of refined management concept in oilfield polymer injection work is expounded.

Keywords: Oilfield exploitation, Polymer injection work, Fine management.

1. Introduction
Petroleum resource is an important resource used in China's industrial development, which is of great significance to China's industrial development and urban construction. In the process of China's development and construction, the decline of oilfield production efficiency is a common problem, and the oilfield production efficiency can be improved by adopting oilfield polymer injection methods. In the modern production construction, in order to further improve the oilfield production efficiency and reduce the oilfield production cost, SL Oilfield has expounded the polymer injection work in the oilfield production process. The following is a detailed description of the fine management of polymer injection in oilfield.

2. Fine management concept
The concept of refined management is an important concept applied in the development of modern society, which is to optimize and reform the management work. In the current enterprise management, production construction, system construction and other work, the application of refined management is conducive to improving management efficiency and promoting the optimization of work quality and accuracy. The core content of refined management is standardized processing and refined processing. On the one hand, it is required to establish standardized management system and process to ensure more efficient management. On the other hand, the implementation of fine management is a fine and meticulous management work, which is different from the traditional rough management work. Its management is more meticulous, and requires the management contents of each link to be clearly divided into different management, so as to improve the management accuracy. In the production and construction of modern enterprises, fine management is very important to improve the production efficiency of enterprises, and also conducive to enterprise management cost control.
3. Application of fine management concept in Oilfield Polymer Injection

3.1. Brief introduction of polymer injection technology in Oilfield
Polymer injection technology in oilfield is an important method applied in oilfield exploitation at present, which is conducive to improving oilfield exploitation efficiency and improving oilfield exploitation quality to the greatest extent. In the process of oilfield exploitation, injecting reasonable oil displacement medium can improve oilfield exploitation efficiency and enhance oilfield exploitation quality. Oil field polymer injection technology specifically refers to oil displacement with polymer as oil displacement medium during oil field exploitation. The polymer injection technology in oilfield exploitation is a chemical flooding method, including surfactant flooding, polymer-surfactant flooding, alkaline water flooding and other flooding methods. In the current oil recovery process, polymer flooding is mainly applied to the tertiary oil recovery stage. Injecting polymer into oil layer can change the water-oil mobility ratio of oil layer and reduce the permeability, which plays an important role in improving the oil production efficiency.

3.2. Application of refined management in polymer injection process in oil field
The application of fine management in oilfield polymer injection work plays a very important role in improving the quality of oilfield polymer injection work, which directly determines the implementation effect of oilfield polymer injection process to a certain extent.

First of all, fine management is implemented in oilfield polymer injection, including managing and supervising the quality of oilfield polymer injection, controlling the construction effect of oilfield polymer injection, ensuring more effective implementation of polymer injection process, and improving the quality of polymer injection to the greatest extent, which also plays an important role in improving oilfield production effect.

Secondly, the application of refined management in oilfield polymer injection is beneficial to the refined management of oilfield polymer injection. It includes speed management, solution management, wellbore management and other process management contents to ensure more effective process implementation and maximize the effect of oilfield polymer injection. Through the improvement of various management effects of polymer injection process, the effect of polymer injection process in oilfield can be reasonably improved, and the technical applicability can be improved.

Third, the implementation of refined management in oilfield polymer injection is beneficial to the cost reduction of oilfield polymer injection. Refine oilfield polymer injection management, including process management and equipment management, so as to prevent serious waste of process implementation, and at the same time, reasonably control polymer injection process equipment. Therefore, the implementation effect of polymer injection process in oilfield is improved to the greatest extent, and the implementation of polymer injection process is ensured to be more reasonable and effective.

4. Implementation of fine management of polymer injection in SL Oilfield

4.1. Introduction to Oilfield
SL oilfield is an important oilfield exploitation area in China, which plays a very important role in oilfield exploitation in China. There are five units of tertiary recovery and direct injection in SL Oilfield, with a total oil-bearing area of 17.85km2 and proven geological reservoir reserves of about 48 million tons. In the process of oilfield exploitation in SL oilfield, it includes one polymer flooding unit and four binary flooding units. In the actual oilfield exploitation process, the oil production effect of SL oilfield oil plant can reach about 98.2%, and the qualified rate of single well oil production is 99%. In order to ensure oilfield production efficiency, SL Oilfield decided to implement fine management of polymer flooding wells. The following are important contents of refined management of oilfield [1].
4.2. Application of fine management of polymer injection wells in SL Oilfield

SL oilfield decided to carry out fine management of polymer injection unit to improve the efficiency of oil well production. In the actual mining process, the main implementation of polymer injection quality supervision, hierarchical management and polymer injection process equipment management, etc., the following is a detailed description of the management content.

1) Implementation of polymer injection quality supervision process in SL Oilfield

In the process of fine management, the quality supervision of polymer injection process is very important, which is conducive to the improvement of polymer injection process effect. Quality management is the core of fine management and the key goal of implementing fine management. In the implementation of fine management in polymer injection wells of SL oilfield, the following supervision work has been completed:

① The working managers of polymer injection wells in SL Oilfield shall reasonably supervise and manage the quality of tertiary recovery agents. Tertiary recovery reagent is an important link in the implementation of polymer injection process, and its reagent quality is directly related to the implementation effect of polymer injection process. In the implementation of traditional polymer injection process, the management and supervision of tertiary recovery agents are neglected, which leads to the unqualified agents flowing into the production process and affects the oil recovery effect. In the process of implementing refined management in SL oilfield, the quality of tertiary recovery agents in oilfield is supervised, including establishing a pharmaceutical supervision and management team, carrying out quality supervision, quality inspection and quality problem handling on purchased agents, keeping records of incoming and outgoing materials of tertiary recovery agents, and implementing comprehensive supervision and management of pharmaceutical quality [2].

② In the process of quality supervision of polymer injection wells in SL Oilfield, relevant technical personnel are selected from the general management department for overall process supervision and management, mainly for quality supervision of polymer injection process implementation links in SL Oilfield, carefully confirming the process implementation flow, establishing a "one-to-one" responsibility system, and well supervising and managing the process implementation of polymer injection wells in SL Oilfield, ensuring better process implementation effect and controlling each production process of polymer injection wells in SL Oilfield.

③ During the supervision of polymer injection wells in SL Oilfield, the data of oil well technology center are also strictly supervised. Data is an important data that truly reflects the status of oil production in oil wells. The error of data precision will affect the subsequent work of adding chemicals and related quality control. In the supervision of SL oilfield, the supervision group supervises the polymer injection technology management center, mainly collects and compiles the relevant technical data of the technology center, and makes relevant technical reports, which are submitted to the oil well management center in two copies, so as to ensure more effective oil well production and improve the oil well production effect to the greatest extent.

2) Classification management of SL Oilfield

In the process of implementing fine management of polymer injection process in SL Oilfield, classified management of extension units is also implemented, and classified management is carried out for polymer injection production units in SL Oilfield to ensure the improvement of management efficiency and maximize management effect [3].

① In the actual fine management process, SL oilfield carries out hierarchical and classified management of polymer injection units. In the implementation of polymer injection process, injection rate and solution viscosity are different processes that affect the recovery efficiency, so different solutions are needed. Therefore, according to different influencing modules of polymer injection unit, SL Oilfield divides oil wells into different modules, such as single sewage injection well, high-pressure under-water well and low-pressure polymer channeling injection, and implements different refined management methods to ensure more effective control of polymer injection process in SL Oilfield.
② In the process of implementing fine management in SL oilfield, production management methods of different unit reservoir geological characteristics are implemented. In the actual fine management process, according to the different geological characteristics of the oil reservoir in the oil well production stage, the reasonable production method and classification treatment method are implemented to ensure the oil production efficiency of SL oilfield and improve the oilfield production effect to the greatest extent.

(3) Fine management of SL oilfield equipment

In the process of oilfield production, the application of equipment is very important, including polymer injection device and water pump, etc. through the use of equipment, polymer injection process can be well completed. Table 1 below is the equipment parameter table of SL oilfield. In order to improve the effect of polymer injection process in SL oilfield, the equipment management was refined in the actual process.

| Device name                  | Quantity |
|------------------------------|----------|
| Positive polymer injection unit | 5        |
| Preparation station          | 5        |
| Dispersion device            | 12       |
| Polymer injection pump       | 259      |
| Clear water centrifugal pump | 21       |

① SL oilfield has established a fine equipment maintenance system in polymer injection unit. It mainly includes regular equipment maintenance inspection system, equipment maintenance record system, equipment maintenance performance inspection system, etc. Through the establishment of equipment fine management system, to ensure more effective equipment management [4].

② In the process of fine management of polymer injection unit in SL oilfield, equipment maintenance team was established and team members were trained regularly to ensure higher efficiency of equipment maintenance.

5. Conclusions

SL oilfield has implemented fine management for polymer injection production technology, which plays a very important role in the implementation efficiency of polymer injection technology. According to the relevant investigation and study, after the fine management of polymer injection process in SL Oilfield, the qualified rate of single well injection allocation increased by 1.4%, the qualified rate of single well concentration increased by 0.8%, the water cut of oil production decreased by 7.5%, the output increased by 313t, and the qualified rate of equipment operation also increased. Practice has proved that the application of refined management in polymer injection management is conducive to improving the effect of polymer injection process.

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