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Analysis of the Losses Incurred During the Collection and Preparation of Oil and Gas Fields

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ABSTRACT: In this article we will study and analyze the systems of collection preparation in oil and gas fields. We will study the conditions of application of technological schemes used in the process. The organization of large centralized collection punches greatly simplifies the schemes for collecting oil and gas from individual deposits and creates favorable conditions for their unification into large entities. In large centralized entities, the separation of oil and gas and the corresponding use of them is much more useful than in small ones. Such centralization makes it possible to reduce the loss of light oil fractions, improve the preparation of oil, provide for deeper processing of gas and maximum extraction of raw materials for the chemical industry.

KEY WORDS: oil and gas collection systems, collection system of the Grozny Institute, pressure Baronyan-Vezirov collection system, pressure Hyprovostok system of collection, separator separator, group measurement device, central collection punk.

I. INTRODUCTION

The collection and preparation of the extracted product during the operation of oil and gas fields is one of the most important processes in the oil and gas industry. It is known to us that the mined product is initially collected in a mine, and the collected product is passed through the initial preparation stage under mining conditions. In this article, we will analyze the technological aspects of these intertwined processes and examine their options, which are the most profitable for the industry with little loss.

Mining mastering requires a lot of expenditure, a large part of the costs incurred will be spent on the construction of systems for collecting and transporting products in the mines. Therefore, improving and simplifying the systems for collecting and transporting oil and gas is essential to reduce capital and operating costs, as well as reduce the time of its appropriation.

II. MAIN PART

In the process of accumulation and preparation of hydrocarbon and its products, a lot of losses occur. In the oil and gas sector, which is now extremely important for industry and the economy, the possible reduction in the loss of mined products is one of the problems facing today. Below we come up with a drawing on the loss of hydrocarbon and its products.

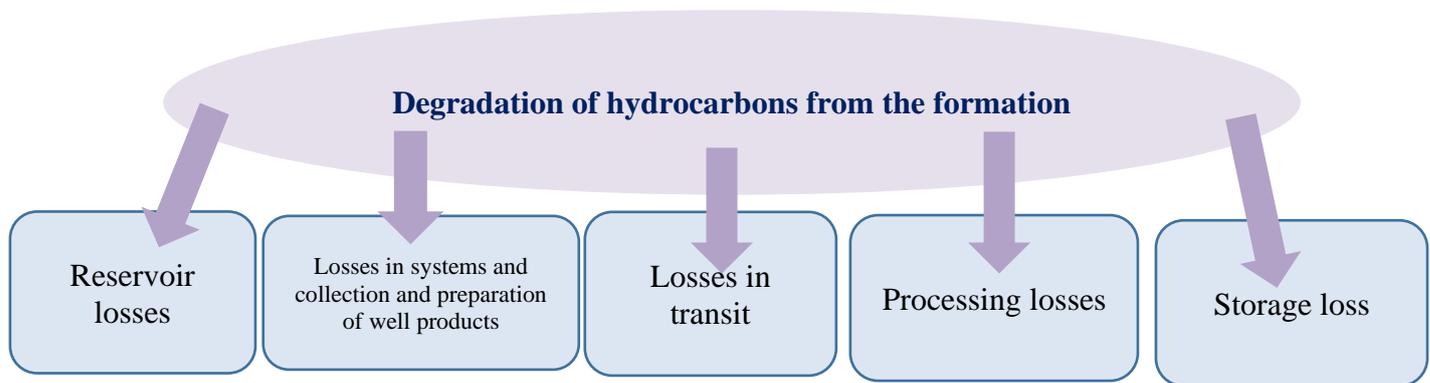
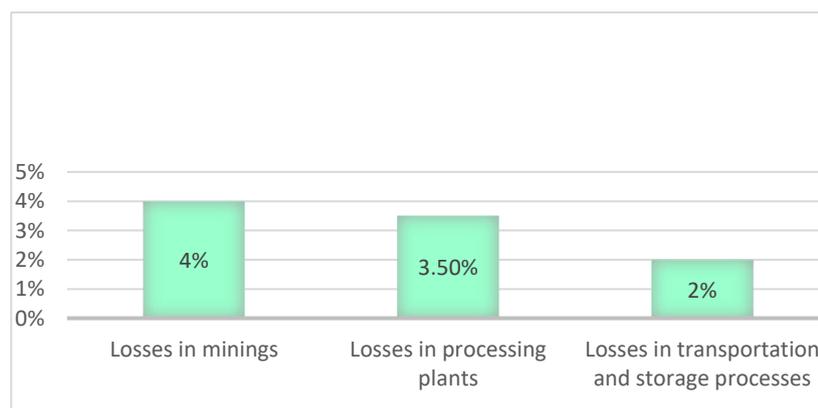


Fig-1. Classification of hydrocarbon and its products for disposal.

As can be seen from the diagram above, hydrocarbons can be lost not only in the process of harvesting and preparing, but also in the layer itself, in the processes of transportation, in the processing and storage processes ekan. In this article, we will look at the processes of losses in the systems of collection and preparation of oil and its products and look for ways to minimize these losses as much as possible. From the results of experiments and scientific research, we know that the extracted oil and its products are in the collection and preparation systems, in the storage and processing processes, up to 9,5% can be lost. In particular, since the loss in deposits is 4%, in processing plants 3,5%, in transportation and storage processes-2%. It can be seen that the extracted oil and a large part of its products are either in the mining it self, in the collection and preparation systems. Below we will consider exactly the processes of losses in the collection and preparation systems.

Classification of lost hydrocarbons



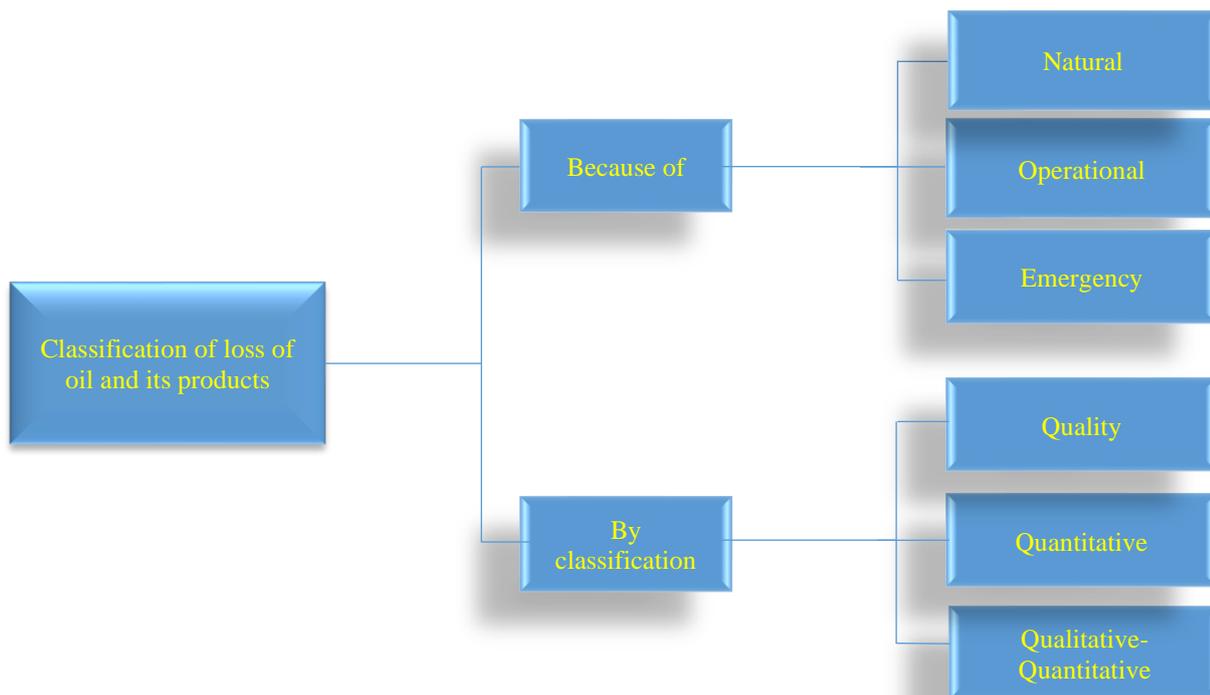


Fig-2. Classification of losses of oil and its products.

As long as oil and its products can be lost in the natural process, in the process of mining and in the event of an accident. At the same time, as long as we can lose both the quality and quantity of the extracted oil.

Below we will dwell on the collection and preparation systems. Currently, several collection and preparation systems are used in the industry. The system for collecting oil and gas in mines includes pipes, measuring instruments and collecting punches, which range from wells to oil or gas preparation devices.

- 1) Collection systems Baronyan-Vezirov.
- 2) Collection system of the Grozny Oil Institute.
- 3) Collection system pressure Hyprovostok.

Scientific and design organizations and a number of oil and gas collection systems have been modernized, developed and introduced on the basis of joint collection and transportation of oil and gas over long distances. For different oil extraction conditions, which will allow to solve the issues of development of oil fields more rationally, it is necessary to approximation and centralization of technological objects, increase the number of separation stages, the correct use of natural energy of oil and gas layers.

One of the fields of the Grozneft Association showed the economic efficiency of the use of a high-pressure system. After the introduction of this system, we can see that the oil cost was reduced by 2.5 percent, and gas by 30 percent.

The oil and gas collection system of the company "Giprovostokneft" under pressurized pressure has been significantly updated. In the latest modification, this oil and gas collection system supplies oil and gas to the oil and gas treatment facilities located at a distance of 100 km or more from the Wells.

The collection and preparation of oil and gas in the fields will be completed by changing the state of the products of the oil wells in sequence and separating them according to their individual composition and knowing the receipt of commodity raw materials. Below we will classify the oil and gas collection systems.

Table-1. Characteristics of collection and preparation systems.

№	Oil and gas transmission and collection systems	Year of creation	Transmission distance	Working pressure in the pipe	Working pressure in the pipe
1	Collection systems Baronyan-Vezirov	1948	7-8 km	0,6 MPa	The system is used in the off position
2	Collection system of the Grozny Oil Institute	1958	100 km	6-7 MPa	With modern conveniences, losses are minimized
3	Collection system pressure Hyprovostok	1960	60-80 km	1-1,2 MPa	There is an opportunity to further expand the collection and preparation system

In the technological schemes of the oil and gas collection and processing system, the following processes are carried out:

- storage of ready-made hydrocarbons and oil for use in the national economy-useful information for all;
- transportation of oil and gas to the norm of commodity raw materials in oil and gas;
- take into account the separation of oil and gas into raw materials and products by Types after processing.
- to provide control of the yield of the product in a well.

When doing this at the same level in a mining itself, the trust in the technological scheme of oil and gas with high technical and economic indicators, or the system of accumulation and processing of the coinng indicators is given. The collection of oil in the deposits is carried out according to the systems of common meters, pumps, pipes and oil collecting punches. Below is a scheme of Assembly and preparation equipment of the turquoise oil field, in which we will dwell on the processes that will be performed.

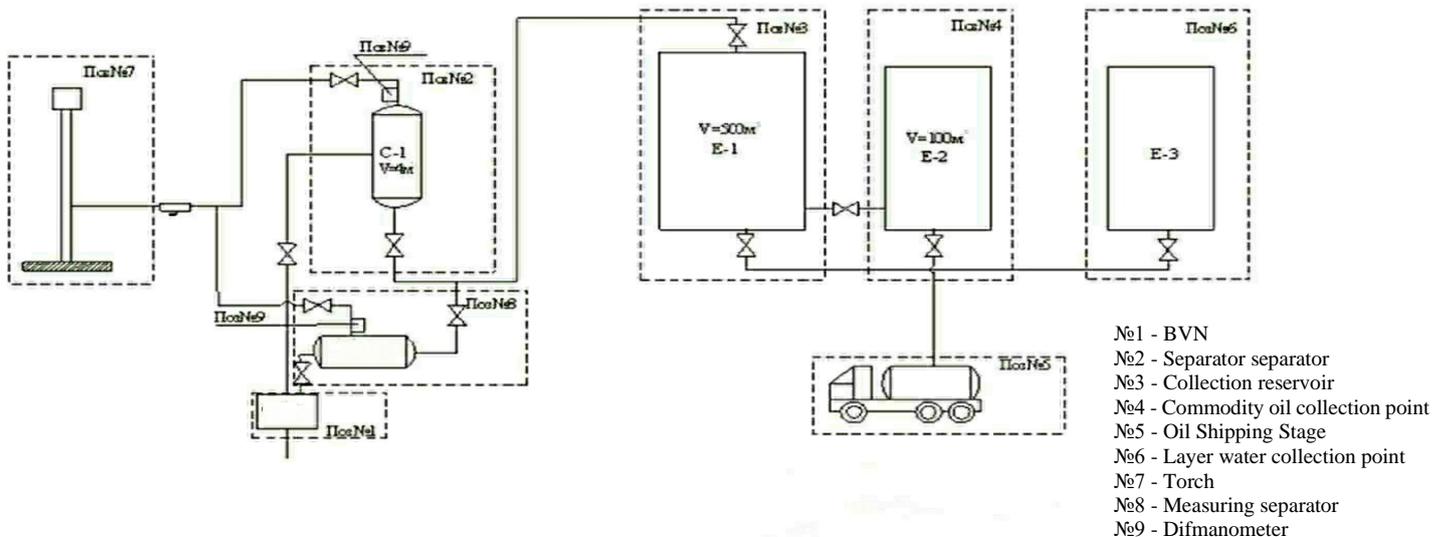


Fig-3. Technological scheme of the equipment for the initial preparation of oil for the turquoise deposit.



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To study the performance and productivity of the well, it is necessary to conduct various types of research. To do this, in the device of preliminary preparation of oil, it is necessary to install a block of input lines, a measuring separator with a pressure gauge and an additional differential pressure gauge in the separation, which has a set of equipment that allows the transition of the well to group measurement.

The collection and preparation systems of the turquoise mine for all variants of indicators of the use of the mine, it is proposed to use a closed collection system, since, at the same time, the technological losses of oil are relatively low.

The proposed scheme of laying the oil wells of the turquoise deposit and the proposed variants of the assembly system are shown in Fig-3. Mining is designed on a tubular illuminated scheme. The schematic diagram of the proposed turquoise mine is shown below and the actual source material, the technological indicators of the mine assimilation, was developed taking into account the results of the prediction and laboratory research. Preparation of oil from the deposit of turquoise in accordance with the requirements of the state standard is carried out as follows. From the C-1 separator, the water-oil emulsion with the residual dissolved gas is sent to the E-1 collection tank with a volume of 500 m³, where the oil is separated from the produced product, then the oil enters the E-2. The size is 100 m³, then it is loaded into the cistern. From the measuring separator, the exhaust gases are directed to the fire.

Equipped for group measurement of borehole product include:

- input line block with a set of equipment that allows the transition of a separate well to group measurement;
- differential pressure gauge metering separator for access to gas torch line;
- separator separator C-1;
- measuring the collection tank to take into account the flow of liquid with the pump.

When doing this at the same level in a mining itself, the trust in the technological scheme of oil and gas with high technical and economic indicators, or the system of accumulation and processing of the coinng indicators is given.

The collection of oil in the deposits is carried out according to the systems of common meters, pumps, pipes and oil collecting punches. The necessary aspects of installing all of the above elements are not required, since there may also be a small number of them. For example, pumps, raw materials tanks and meters are elements of individual or group devices, and the efficiency of the well is carried out when the gases are separated.

If the system consists of individual devices – the individual devices of the oil collection system are called, If there are group devices in the system-the group devices of the oil collection are called. If, together with oil, gas is collected through a pipe, it is called a generalized system of oil and gas, or a single pipe. Its difference from the system is that oil is collected through one pipe, and gas-through another pipe. Due to the requirement for oil refining, it is installed separately for each type of oil collection systems, it is not allowed to mix oil of different composition with each other.

In addition, this system implies the use of layer energy or pressure generated by Deep Well pumps to transport the gas over long distances from the first separation phase without a compressor. The production of oil wells is assigned to group measuring devices, where the flow rate of Wells is measured from time to time. In addition, these products are supplied through a single pipe to the first-stage separators, which are grouped in local separation punches. After the first stage is allocated, the gas is sent to consumers due to the pressure in the separator, and the oil with the remaining dissolved gas is sent to the centralized collection facility. At this time, the preparation of oil and gas for the final separation of two phases, the preparation of oil for delivery to the consumer, the processing of gas at all stages of separation and the pouring of waste water into layers is carried out.



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III. CONCLUSION

In conclusion, when designing oil and gas collection systems in mining conditions, it is necessary to take into account the possible reserves of oil and gas that can be obtained from the heap, the geographical location of the deposit, the methods of delivery to the processing plant and other important indicators. The more simple the assembly systems are, the less the loss is minimal, and the less the metal being spent, the more profitable. In this paper, we considered the proposed variant of the system for collecting and preparing oil for the Feruza oil field, and gave this as a conclusion, based on the above information. Since in the systems of collecting and preparing oil, one must first pay attention to the following indicators.

- technical and economic indicators of oil and gas collection and processing;
- to the level of system automation;
- comparative consumption of metal;
- number of service personnel;
- comparative consumption of electricity and others.

In the field of turquoise oil, attention was paid to exactly these indicators, and an option was chosen, in which technological losses were much less. At present, these collection and preparation systems are used wisely in mining. Today, a lot of work is being carried out on the development of oil and gas collection systems in the oil-gas regions of many countries, the technical and economic basis of oil and gas collection and preparation and shipment are being analyzed. In the future, in our country, too, it is planned to develop rational options for the system of collecting and preparing oil and introduce it into the ointment.

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