ASSESSMENT OF THE EQUIPMENT USED IN THE DISPOSAL OF GASES IN LOW-PRESSURE FIELDS AND ITS ECONOMIC EFFICIENCY

A.Kh. Samadov, Acting Professor of the Department "Oil and Gas works" of Karshi Engineering economic institute.

Ashurov Sh.M. Assistant of the department "Development and operation of oil and gas fields". Tashkent State Technical University named after Islam Karimov.

Boikobilova M.M., Assistant of the Department of Economics and Engineering, Karshi International University. Uzbekistan, Karshi.

Annotation

Today, a decrease in oil production indicators, non-proliferation of new oil fields, a decrease in pressure at the fields in operation affect the oil production indicator. Therefore, the use of new technologies in the disposal of gases produced at low-pressure fields remains relevant.

keywords: *disposal, environmental Environment, Atmospheric Protection, compressor station, hydrate formation, torch gases, driving aggregates.*

ОБОРУДОВАНИЕ, ПРИМЕНЯЕМОЕ ПРИ УТИЛИЗАЦИИ ГАЗОВ НА МЕСТОРОЖДЕНИЯХ НИЗКОГО ДАВЛЕНИЯ И ОЦЕНКА ЕГО ЭКОНОМИЧЕСКОЙ ЭФФЕКТИВНОСТИ

Самадов А.Х., и.о.доцента кафедры «Нефтегазовой дело» Каршинского инженерно-экономического института.

Ашуров Ш.М. ассистент кафедры "Разработка и эксплуатацию нефтяных и газовых месторождений". Ташкентский государственный технический университет имени Ислама Каримова.

Бойқобилова М.М., ассистент кафедры «Экономики и инженерии» Каршинского международного университета. Узбекистан г. Карши

Аннотация

На сегодняшний день снижение показателей добычи нефти, нераспространение новых нефтяных месторождений, снижение давления на

эксплуатируемых месторождениях влияют на показатель добычи нефти. Поэтому актуальным остается использование новых технологий при утилизации газов, добываемых на месторождениях с низким давлением.

ключевые слова: *утилизация, экологическая среда, защита атмосферы, компрессорная станция, образование гидратов, факельные газы, приводные агрегаты.*

In the oil and gas sectors, activities are planned to ensure the ecological environment of meyori and the disposal of natural gas, oil satellite gases and gases. Currently, when collecting products from wells in oil fields and in the process of preparing a neftgazkondensat mixture, gases are separated from the composition of the effect from special separation devices, and condensates are degassed and burned into the atmosphere in torches due to low pressure due to the inability to give the gas to the transport system.

The Kruk, West Kruk, South Kemachi, North Urtabulak and Umid oil and gas condensate fields are part of the group of Mubarakneftgaz LLC fields and are located in the territory of Bukhara and Kashkadarya region. Deposits in this group include oil and gas condensate fields, gaz condensat fields and oil fields.

At the fields of the Mubarek group, oil and gas deposits are used in a single system. In most wells, the products are collected in a closed sealed system. A compressor station is being built for utilization of associated gases at the Southern Kemachi's oil and gas condensate fields. Emissions of additional pollutants into the environment from existing field facilities are taken into account at all times.

It is known that in the near future the oil part of the well was worked out from the Southern Kemachi’s field, and the products from the existing oil wells will be collected using two automatic group measuring units. In 2004, a gas complex preparation facility was built for industrial test use at the South Kemachi’s mine. In industrial test use, the data of the detected mine in one was obtained, and on the basis of this data, industrial production was designed to ensure the maximum extraction of hydrocarbons from the reservoir in the layer. When oil and gas heaps are used together, all products of extracting wells (gas liquid mixture) are collected directly by coming to the gas complex preparation device. From there, the gas condensate and water mixture are fed to the refinery, where complex treatment is performed and the gas liquid is divided into two components: gas and liquid hydrocarbons, produced water and dissolved gases. The gas is collected by the line of the inlet block connected to the wells through the beam system and transported by the collector to the gas treatment facility. The oil gas condensate mixture is prepared in a low-temperature separation device using the drossel-effect [1,2, 3,6].

Diethylenglycol is used as an inhibitor in hydrate formation. The one-year capacity of the gas complex preparation device is equal to $3.0x10^9 m^3$/year.

The purified and dried gas is fed through the measuring node to the connecting Southern Kemachi’s-Urtabulak gas transmission, and from there the medium-Mubarak gas processing plant is transported to the gas transmission. Purified and dried gas is supplied through the measuring unit to the South Kemachi-O'rtabulak

interconnecting gas transmission and from there to the O'rtabulak-Mubarek gas processing plant gas transmission.

The following oil field equipment complex has been installed in the South Kemachi's field: wells, automatic group measuring device, oil transmissions, reservoirs, pumps and torch equipment, gas complex preparation device, oil preparation device, etc. Waste from these structures has an anthropogenic effect on the environment.

The Kruk and West Kruk flare gases flow together through the South Kemachi compressor station interconnecting gas pipeline, which also receives gas from the North O'rtabulak and Umid fields.

To measure the flow rate of flare gases, measuring units are installed at the exit from each field to the connecting gas pipeline-collector. The Kruk Oil Processing Unit, Automatic Multiple Metering Unit * for 1,2,3,4,5,6 mesh gas and together with West Kruk gas will be sent to the South Kemachi Compressor Station. Gas is also supplied to the compressor station through the automatic group measuring installation of North O'Habulok - line-2 of the inlet unit at 1,2,3. According to hydraulic calculations, the pressure of the gas pipeline with a diameter of 530x6 mm is 0.1 MPa and the temperature at the last end of the 34^0C is 5.0 kilometers long.

Air pollutant emissions from existing facilities are about 3188.1 t/year. Most of the emissions are carbon monoxide - 63.81%, hydrogen sulfide - H2S, nitrogen - NO^2, dry and nitrogen oxide - NO [4,5].

Compression system includes gas distributor on filter-separators before regenerating device, gas distributing device, air distributing device for its cooling and filter-separators of condensed liquid separation. According to 2.6 calculations, compressor power and 25.53 MW are required to compress gas from 0.1 to 5.6 MPa per day. The transmission to the Southern Kemachi's compression compressor station-the size of the collector diameter is equal to 325x10 millimeters in the connection to the Southern Kemachi-O'rtabulak-Mubarek gas processing plant and 1 kilometer in length. Therefore, due to the operation of the compression compressor station and other facilities, additional gas is released into the atmosphere, and the combustion dump products of hydrocarbons. The composition of such emissions includes nitrous oxide-24.6% and carbon monoxide - 67.82%.

The total discarded waste is 8 species (hydrocarbons methane, carbon monoxide, nitrogen two oxides, sulfur two oxides, nitrous oxide, hydrogen sulfide, soot and hydrocarbons), and is 1140.2 tonnes/year. Taking into account the fact that in the Kruk field after 2013, most wells were transferred from the gaslift method to the barbell depth pump device, the volume of non-disposal gases will be sharply reduced, and its amount will be equal to the amount of satellite gases contained in the extracted oil.

Emissions into the atmosphere will be reduced by 2047.88 tons/year due to the disposal of oil gases from the Mubarak Group fields. Emissions into the atmosphere will be reduced by 2047.88 tons/year due to the disposal of oil gases from the Mubarak Group fields. Thus, it became known about the burning of 9.3%

of all produced gas. According to the information of Uzneftegazdobycha JSC, 317,000 m^3 of gas per day is emitted and polluted from the North O'Rabulak field into the atmosphere. It is known that some of the wells in the Kruk field are used by the gas lift method and after the implementation of gas lift, exhaust gas is burned together with oil. For the operation of wells by the gas lift method, gas is supplied from the Umid field and amounts to 457 thousand m^3/day.

From the fields of the Mubarek group, the total flow of flare gases enters the compressor station at the South Kemachi field, where it is filtered. The device cleans solids by 100%, and moisture drops - by 8 micrometers or more. Filter separators are equipped with a system for collecting and removing purified gases.

After that, the purified gas is collected in the gas recirculation device at the inlet of the compressor shop of the compression compressor station. In addition, the structure of the compression compressor station includes: compressors of the gas recirculation station unit, compressor separators, separators at the inlet of the gas recirculation unit, systems for connecting pipelines and fittings, and the fuel gas system of the gas recirculation unit. Separators included in the gas recirculation unit module prevent the condensed gas from entering the compressor in liquid form after the recirculation station unit. In the South Kemachi field, gas disposal is carried out at the compression compressor station of the first option under a pressure of 0.1 to 7.55 MPa, and the volume of gas is measured at the measurement nodes and collected in a complex gas preparation device through a special gas transmission.

Based on approximate calculations, the potential composition of C_{5+} in the total flare gas flow is 45.74 g/m^3 and when condensate is extracted in the amount of 60%, the additional gas coming out of the complex gas preparation device of the Southern Kemachi mine is 71,354 t/day or 23,546 t/year. according to the second option of the compression compressor station, gas is compressed at a pressure of 0.1 to 7.5 MPa and is measured through measurement nodes and directed to the gas transmission of the South Kemachi-Northern O’rtabuloq-Mubarak gas processing plant. When compressing gas through a compressor at a pressure of 0.1 to 5.5 MPa in the amount of 2.6 million m^3/day, the compressor shaft consumes 25.53 MW of energy. two-stage centrifugal pump unit is installed on gas turbine drive during construction of compressor station. A pumping station unit, separators and a fuel gas preparation unit are installed in the production building.

Selective compression of gas is carried out at two stages, the first stage enters the cooling apparatus with gas air, and the second stage is cooled to low pressure before supply. when the pumping station unit exits, gas distributors are installed to separate condensed liquid contained in the gas after its cooling. After the second step, the gas is supplied to the cooling plant and cooled to the required temperature in the unit of the high pressure station. Then they are collected in separators, and then transferred to a measuring unit and a gas pipeline. To measure flare gases, measuring units are installed, which are quickly measured from each field to the connecting gas transmission headers.

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In addition to the compressor shop, the following are installed on the square: gas cleaning device; device for cleaning and preparation of buffer gas from hydrogen sulfide; pulse gas preparation device; gas measurement unit; nitrogen storage area; flare facilities.

The hydrogen sulfide buffer gas treatment unit provides fuel to the compressor station and buffer gas to the gas transfer unit. The scheme of the device also provides for cleaning from hydrogen sulfide. The pump oil tank supplies the unit with oil, during the operation of the compressor station, oil is cleaned and regenerated. From safety valves and process equipment, gas is discharged to flare headers and transferred through the separator to the flare system. complex of fully auxiliary buildings and structures on the compressor station area is considered.

Gas cleaning equipment includes block and enclosing, adjustment and reinforcement devices, fasteners and pipelines. equipment installed at the compressor station ensures the safety, reliability and efficient operation of the system, including instrumentation and automation, oil level control, vibration, cooling, gas generation and fire control, automatic fire extinguishing, heating, ventilation, and air supply.

Literature used

1. Samadov A.X., Shukrullayev D.D., Shodmonqulov A.O Parrakli burg‘ilarning turlari va tuzilishini o’rganish // Экономика и социум. 2024. №5-2 (120). URL: https://cyberleninka.ru/article/n/parrakli-burg-ilarning-turlari-va-tuzilishini-o-rganish (дата обращения: 21.09.2024).

2. Samadov, A. X., Ahadova, G., & Shukrullayev, D. D. (2023). PDC TURDAGI INNOVATSION BURGILARNING QOLLASHNI ASOSLASH. Экономика и социум, (5-2 (108)), 340-346.

3. Samadov A. X., Qosimova A. Y. ZAMONAVIY ROCKSTRONGTM VA GIDRO-SEAT BARREL TIZIMI (HSBTM) KERN OLISH TIZIMLARINI ASOSLASH //Экономика и социум. – 2024. – №. 2 (117)-1. – С. 621-624.

4. Самадов А. Х., Бойқобилова М. М., Мажидова Ю. С. ТЕХНОЛОГИЯ ВОЗДЕЙСТВИЯ ПАРОВОГО ТЕПЛА И ГОРЯЧЕЙ ВОДЫ НА ПЛАСТ ЧЕРЕЗ НАГНЕТАТЕЛЬНУЮ СКВАЖИНУ // Экономика и социум. 2023. №10 (113)-1. URL: https://cyberleninka.ru/article/n/tehnologiya-vozdeystviya-parovogo-tepla-i-goryachey-vody-na-plast-cherez-nagnetatelnuyu-skvazhinu (дата обращения: 11.11.2024).

5. Samadov A.X., Kasimova A.Y., Umedullayev A.G. USE OF GEONAVIGATION SYSTEM IN CONTROLLING AND FAST CONTROL OF HORIZONTAL WELLS' STEM TRAJECTORY // Экономика и социум. 2024. №3-1 (118). URL: https://cyberleninka.ru/article/n/use-of-geonavigation-system-in-controlling-and-fast-control-of-horizontal-wells-stem-trajectory (дата обращения: 11.11.2024).

6. Nomozov B.Yu., Samadov A.X., Yuldashev J.B., Boyqobilova M.M. ISM TURDAGI QATTIQ QOTISHMALI BURG`ILAR // Экономика и социум. 2023. №9 (112). URL: https://cyberleninka.ru/article/n/ism-turdagi-qattiq-qotishmali-burg-ilar (дата обращения: 11.11.2024).