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OIL PRODUCTS AND PUMPING STATIONS

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Abstract: From several wells on the oilfield field, crude oil is transported by pipelines to collecting stations, the number of which depends on the layout and the yield of the wells. Boreholes can be fountain gutters and pumps. Purification of crude oil is carried out in collection stations. Gas is a regular companion of crude oil, and therefore each collecting station has gas discharge devices. Purified crude oil is transported through several pipelines to pipeline to the dispatch station, and from here by the main pipeline to the refinery or to the loading station, if the transportation to the refinery is carried out by means of mobile means (wagon tanks, car tanks, tankers). From the gas obtained, butane and propane, as well as carbon dioxide and sulfur are separated in the collection stations, if present in the gas.
Keywords: collection pipelines, oil pipelines, collection stations

INTRODUCTION

Crude oil is a multiphase-multicomponent mixture of various hydrocarbons, water, gas and Solid particles. The properties of crude oil depend on the massive participation of certain phases and components in Mixture. The diameter of the main pipelines is usually over 500 mm, the length is over 50 km, and the pressure of the transported raw material at the beginning of the pipeline is 50-65 bar and more. The collection pipelines in the oilfield fields have a much smaller diameter and its size depends on the volume of the well. They are usually 100-150 mm, but they can be even larger. In order to ensure the continuous receipt of crude oil from the collection stations from oilfield fields and the optimum regime of the main oil pipeline, the dispatching pump station, often referred to as the main pump station, has a large reservoir space. At the main pumping station, the first introduction of the transported raw material into the pipeline is performed, as well as the control of physical properties, if this has not been done previously. Figure 1 shows the technological scheme of the main pipeline.

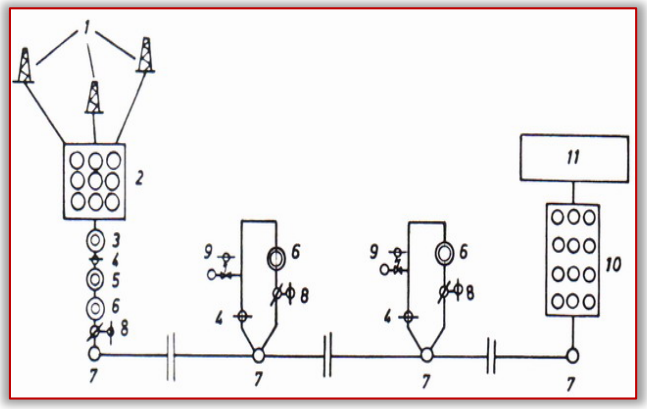

Figure 1. Technological scheme of the main pipeline

From several wells (1) from oil fields, crude oil is transported by pipelines to collecting stations (2). In collecting stations, purification of crude oil is carried out. The purified crude oil is transported from a number of collecting stations by a main pipeline to a delivery station consisting of: main pumping stations (3), filters (4), measuring devices (5) and auxiliary pumping station (6). Crude oil is further transported by a main pipeline along which there are devices for introducing and extracting a pipeline cleaner (7), as well as auxiliary stations in which the pressure increase and heating of the oil are made, consisting of: an auxiliary pump station (6), a filter (4), a pressure regulator (8) and a hydraulic shock absorber (9). Crude oil comes to receiving stations with tanks (10), and then pipelines are transported to the refinery (11).

OILFIELDS

Boreholes can be:

- fontanske,
- gas-lifts,
- pumpne.

Fontane boreholes are those in which the oil pressure in the well is sufficient to expel oil to the surface of the earth and carry the oil transport to the reservoirs within the collection stations.

Gas-lift wells are those in which the oil pressure in the well is not sufficient to expel oil into the surface of the earth. Due to this, at a certain depth, a gas under pressure, which flows, is injected It vertically pushes up crude oil upward so that oil goes up to the surface of the earth.

Figure 2. The appearance of the pump well

Pump holes (Figure 2) are those in which, in addition to insufficient pressure of the well, the oil is discharged. On the surface of the earth, the borehole also has a slight abundance. Then use the piston-piston pumps with Weights. The fountain wells become gas-lifts and pumps over time, as time pressure decreases Wellness of the well.

COLLECTING PIPES AND SABIRNE STATIONS

The collection pipelines have the task of transporting crude oil from the wells to the collection station. The collection pipes are made of steel. The diameter of the collecting pipeline depends on the wellness of the well and it ranges from 100 to 150 mm, although it can be even larger. In the collecting stations (Figure 3), crude oil is purified. Gases are allocated, Water and solid particles.

Figure 3. The appearance of the oil collecting station

The process of extracting crude oil from gas can also begin in the collection pipelines itself specific pressure and temperature of the mixture. In the collection stations, the units are separated gas is extracted from crude oil. Then the butane and propane, carbon dioxide are separated from the gas obtained and sulfur.

After the extraction of the gas from crude oil in the tanks, water and solid particles are removed. Water and Solid particles are heavier than crude oil and after a few hours of resting water and solid particles fall to the bottom of the reservoir in the form of sludge. This sludge selection process can be intensified Heating crude oil and adding calcium chloride. Purified oil is pumped into pure Reservoirs, and then the water and solid particles are transported to the place where it is carried out by the drainage channels Water treatment. Sulfur is extracted prior to transport to the crude oil dispatch station.

OUTPUT PUMP STATIONS

The purpose of the delivery pump station is multiple. In the dispatch pump station (Figure 4) are:

- the reservoir space accepts crude oil from collecting stations;
- pressurizes crude oil;
- refining crude oil;
- regulates the pressure of crude oil in the main pipeline and,
- performs measurement of physical properties of crude crude oil.

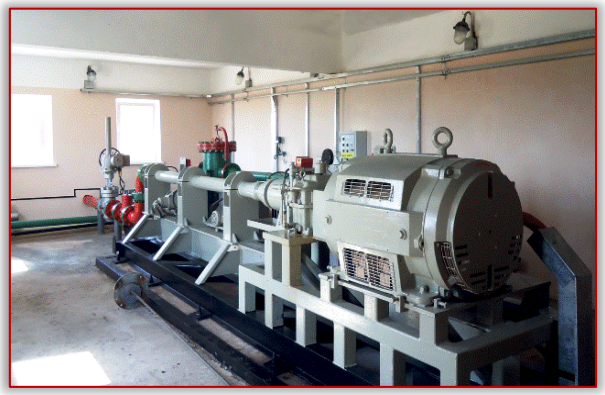

Figure 4. Pump station

Due to the fall of the pressure during transport, they are installed along the pipeline of the auxiliary pump station in which the increase in the pressure of crude oil compensates for lost energy in the previous one shares and heats up if necessary. At that time, the auxiliary pumping stations were supplied larger tank space and crude oil heating devices. Auxiliary pumping stations are usually built along the main pipeline route near the inhabited Places, electricity connections, water supply and sewerage.

Distance between the main pump the stations and the first auxiliary pumping stations are 100 to 150 km, and the distance between the auxiliary ones pumping stations from 50 to 80 km. If the pipeline has to be laid far from the inhabited and if this would make it difficult to maintain pumping stations and generally exploitation. Then these distances are increased to 200 km between the main and the first auxiliary pump Stations, or up to 100 km between the following pumping stations.

MAGISTRAL OILS

Main pipelines are the pipelines through which they are transported (Figure 5):

- refined oil from shipping stations in oil fields to refineries or loading boats Stations for loading mobile means of transport;
- refined oil from unloading stations in river and seaports to refineries when crude oil is supplied to tankers and refer oil crude oil from refineries to large consumers or to loading stations when their transport is predicted by mobile means of transportation. The diameter of the main pipeline is above 500 mm, the length is over 50 km, and the pressure is transported oil at the beginning of the pipeline from 50 to 65 bar and more.

As part of the refinery, when crude oil is transported through the pipeline, or in the circle of consumers centers, if the products of crude oil are transported through an oil pipeline, there are reception stations with Sufficient tank space (Figure 6). When one pipeline predicts Supplying more refineries, or supplying more consumers with crude oil products, then Such an oil pipeline is equipped with drainage pipelines, devices for measuring delivered quantities and Remote

control devices. The same is true when a pipeline is being moved to a place Oil for the loading station for filling a wagon tank, tank or tanker.

Figure 5. Appearance of the above-ground oil pipeline

Figure 6. It looks like a tank space

Magistral oil pipelines are usually buried in the ground at a depth of 0.8 to 1.1 m measured from surface of the earth to the upper edge of the pipeline. Depth of digging depends on the category of oil pipeline and the width of the protective belts of the populated areas, the facilities near the pipeline, etc. The depth of burial is Increases to 1 to 1.35 m when various obstacles have to be overcome when laying pipelines: Waterways, roads, railways, etc. The depth is then measured from the bottom of the water flow, respectively from the upper edge of the road, rail, etc. Sometimes the main pipelines are laid above the ground on concrete Columns of height from 0.5 to 0.75 m. There are other ways of laying off the main pipelines: Beneath the sea and lakes at various depths, above wetlands, etc.

Valves are installed every 10 to 15 km along the pipeline route in order to prevent major losses Oil if, for any reason, pipeline breakdowns occur. Damaged place is blocked by valves between which it is located. At the distance along the 15 to 20 km route, the house of the watchman is being built Oil pipeline, which includes a handy workshop with the most important tool for removing smaller ones Breakdowns on the pipeline. A pipeline cleaner (Figure 7) is used to clean the pipeline. The pipeline cleaner is through the cleaners Station enters the pipeline. Moving through the pipeline, he removes the deposits from the pipe wall.

Figure 7. The appearance of the pipeline cleaner

Crude oils that are very viscous (heavy crude oil) must warm up before being introduced into Pipeline. This is done in the main and auxiliary pump stations that are then equipped Boiler rooms. Boilers are usually fueled by the transported oil itself, and as a heating fluid Hot water or overheated steam is used. Oil pipelines as well as other pipelines through which energy fluids must be transported must be equipped with fire extinguishers. Propulsion motors must be protected against explosion and they are located in separate departments, especially when it comes to petrol and diesel engines, or bath tubs for use, engines that consume gas are used as propellants.

CONCLUSIONS

Due to the fall of the pressure during transport, auxiliary pumping stations are installed along the pipeline in which, by increasing the pressure of crude oil, the lost energy in the previous section is compensated and it is doing the heating of crude oil if necessary. At that time, the auxiliary pumping stations are equipped with a larger tank space and heating devices for crude oil. Auxiliary pumping stations are usually built along the main pipeline route near settlements, electricity connections, water supply and sewerage. The distance between the main pump station and the first auxiliary pump station is 100-150 km, and the distance between the auxiliary pumping stations is 50-80 km. Crude oil that is very viscous (heavy crude oil) must warm up before being introduced into the pipeline. This is done in the main and auxiliary pumping stations that are then equipped with boiler rooms.

Note

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