diagnosis. It can also help doctors choose treatments most likely to be effective for each person.

The same way program has second important direction, which is connected with rare disease. Most of them have a genetic component. Changes to DNA are involved in about 80% of rare diseases. Scientists look at every letter of DNA in a person's genome. This gives them more chances to find the change that is responsible for causing a disease. And gives possibility to find new unexplored disease.

On 5 December 2018 the project reached its main goal and collected sequencing of 100.000 whole genomes. As a result the UK has become the first nation in the world to apply whole genome sequencing at scale in direct healthcare, that's why they have possibility for providing access to high quality identified genomic data for the research aimed at improving patient outcomes.

Summarizing the information I must say that genomics is going to be fundamental for the future of the healthcare, transforming outcomes for patients. The specialists in the sphere of genomic use these technologies and it has already had impact on healthcare. Along with Elon Mask's projects, this is the most exciting project on the planet because it could change all the knowledge and the attitude to medical treatment and healthcare. In my opinion this program could help to cope with great problems of humanity.

References:

1. https://www.genomicsengland.co.uk/news
2. https://www.genomicsengland.co.uk/understanding-genomics/
3. https://www.genomicsengland.co.uk/about-genomics-england/
4. https://en.wikipedia.org/wiki/Gene
5. https://en.wikipedia.org/wiki/DNA

FOUNTAIN OPERATION

Danylo Poshenov, student
Yevheniia Moshtagh, Associate Professor, PhD (Philology), Language Consultant
O. M. Beketov National University of Urban Economy in Kharkiv

The method of operation of wells, in which the rise of oil or a mixture of oil and gas from the bottom to the surface is carried out at the expense of reservoir energy, is called the fountain operation.

If the pressure of the liquid column that fills the well is less than the reservoir pressure and the bottomhole zone is not contaminated (the wellbore is connected to the formation), then the fluid will overflow through the wellhead, i.e. well will gush. Gushing can occur under the influence of hydrostatic pressure or the energy of a gas that expands, or of both.

Gushing only due to the hydrostatic pressure of the reservoir is a phenomenon quite rare in the practice of operating oil wells. This occurs when the reservoir oil contains a small amount of gas. At the same time, the reservoir pressure is higher than the pressure of the oil column that fills the well.

With all methods of operation, including the fountain one, the rise of liquid and gas to the surface occurs through the pipes of small diameter, which descend into the well before they begin operating. These pipes are called pump-compressor. Depending on the method of operation, they are also called fountain, compressor, pumping, as well as lifting.

In the case of fountain operation, tubing with diameters of 60, 73 and 89 mm is used in most cases, and for high-flow wells – diameters of 102 and 144 mm.

The wellhead is equipped with steel reinforcement (tubing head and a Christmas tree).

Fountain fittings are distinguished according to constructive and strength characteristics:

1) according to the working pressure - the plants produce a Christmas Tree Assembly designed for pressures from 7 to 105 MPa;
2) by the size of the flow area of the trunk – from 50 to 150 mm;
3) by the design of the Christmas tree – cross and tee;
4) by the number of rows of pipes that go down into the well - single-row and two-row;
5) by types of locking devices - with valves or with cranes.

Fountain valves with barrel diameters of 100 and 150 mm are provided for high-output oil and gas wells. Valves designed for pressure 105 MPa can be used for ultra-deep wells or wells with abnormally high reservoir pressure. Reservoirs designed for operating pressures from 7 to 35 MPa are mainly used for flowing oil wells.

The development and commissioning of the flow of a well is carried out with the fountain fixture installed on its mouth and the flow-out flow pipes in one of the following ways:

1) replacing the fluid that fills the well after drilling with a lighter one;
2) saturation of the fluid that fills the well with gas or air that is injected from the surface – by forcing the compressed gas (air);
3) replacement of fluid in the well for the gas-liquid mixture (aeration)

Proper operation of a well is to ensure optimal flow rate with the least possible gas factor. In the process of spouting, it is necessary to adjust the ratio of oil and water in the production of a well, when it starts to water out as a result of a breakthrough of the contour or bottom water.

The work of the well in most cases is governed by the creation of back pressure on the flow lines using fittings with a through hole in the center. The diameter of the hole depends on the specified mode of operation of the well and is selected experimentally. The usual borders of the diameters of fittings are 3 ... 15 mm, rarely higher.

One of the main problems that impairs the operation of the well is the deposition of paraffins on the walls of pipes. There are various ways to deal with these deposits:

1) melting paraffin by heating;
2) dissolving paraffin with different solvents;
3) mechanical removal of paraffin from the pipe walls using scrapers.

References:

1. Бойко В. С. Справочник по нефтегазовому делу / В. С. Бойко и др. – Львов. – 1996. – 620 с.

2. Копей Б. В. Расчеты, монтаж и эксплуатация бурового оборудования : учебник / Б. В. Копей. – Ивано-Франковск : Факел, 2001. – 446с.

3. Муравьев И. С. Технология и техника добычи нефти и газа / И. С. Муравьев. – М. : Недра, 1971. – 469 с.

4. Червинский В. П. Введение в специальность «Нафтогазова справа» / В. П. Червинский. – Харьков. – 2013. – 118 с.

HYBRID TRANSPORT SYSTEMS

Roman Pustovit, graduate student
Dmitry S. Lyuchkov, Associate Professor, PhD (Engineering), Research Advisor
Elena V. El Kassem, Senior Lecturer, Language Advisor
Ukrainian State University of Railway Transport

The hybrid transport facility can be defined as a transport mean which combines several key engineering solutions; they can be applied independently or interchangeably for various transport facilities. The concept of hybrid transport implies a complex combination of independent operational principles, aimed at the optimal efficiency values, universality and maintainability.

One of the hybrid transportation facilities is those combining several power supply sources. Their basic power schemes are:

- an internal combustion engine and an electrical engine supplied by an accumulator;
- power supply from a contact network and an internal combustion engine;
- power supply from both a contact network and an accumulator.

Any of the schemes takes the main (basic) source, and the additional (auxiliary) source. In the above-mentioned power supply schemes, the main power source is indicated first.

The basic idea behind the hybrid power energy scheme is a need to achieve various capacity values on different sections along the route, which depends on the effective work required. Therefore, all sections can be divided into ‘heavy’ ones, which require more energy, and ‘light’ ones, for which the same amount of energy can be redundant. For example, the capacity needed to start up a train or to overcome a guided slope along the route, is considerably higher, than that needed