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**Кафедра иностранных языков**

# **АНГЛИЙСКИЙ ЯЗЫК ДЛЯ НЕФТЯНИКОВ**

*Методические указания к практическим занятиям  
для студентов специальности 21.05.06*

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Основная цель методических указаний — формирование навыков и развитие умений работы с оригинальными научно-техническими текстами с последующим использованием информации в речевой практике. Особое внимание уделяется формированию активного словарного запаса. Текстовый материал сопровождается разнообразными упражнениями, позволяющими активизировать познавательную деятельность студентов.

Предназначены для студентов специальности 21.05.06 «Нефтегазовые техника и технологии. Разработка и эксплуатация нефтяных и газовых месторождений».

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## **ВВЕДЕНИЕ**

Данные материалы предназначены для практических занятий для студентов специалитета направления подготовки 21.05.06 «Нефтегазовая техника и технологии, Разработка и эксплуатация нефтяных и газовых месторождений».

Целью методических указаний является формирование навыков и развитие умений работы с оригинальными научно-техническими текстами с последующим использованием информации в речевой практике. Особое внимание уделяется формированию активного словарного запаса, а также развитию устной монологической и диалогической речи.

Текстовый материал сопровождается разнообразными упражнениями, позволяющими активизировать познавательную деятельность. Ссылки на видеоматериалы о реальных проектах и анимированные лекции, а также разработанные к ним задания нацелены на повышение интереса и мотивации студентов.

Для развития навыков устной речи по специальности предлагаются вопросно-ответные задания, дискуссии и работа в парах.

Методические указания можно использовать как на практических занятиях, так и для самостоятельной работы.

**Text 1**  
**WHAT DO YOU KNOW ABOUT OIL?**

**Task 1. Discuss the question from the title with a partner.**

**Task 2. Scan the text for the words given in the table below and translate them.**

petroleum	
applied to	
hydrocarbons	
crude oil	
to refer to	
natural gas	
to construe	
to comprise	
semisolid	
hydrogen/carbon compounds	
impurities	
nitrogen/ sulfur	
to make up	
coal	
to be derived from	
to lay down (laid, laid)	
ancient	
organic matter	
subsequent layers	
sedimentary materials	
initial	
recent event	
deposit	

**Task 3. Read the text. What information is new for you?**

The word petroleum – from the Latin *petra*, rock and *oleum*, oil – is properly applied to liquid hydrocarbons and is a perfectly good synonym for crude oil. It is also widely used to refer to natural gas. The term “petroleum industry” generally refers to both the oil and gas industries. Thus construed, petroleum comprises a large and complex group of liquid, gaseous, and semisolid hydrocarbons, i.e.

hydrogen/carbon compounds that often contain “impurities” such as nitrogen, oxygen, sulfur.

The complex hydrocarbons that make up oil, natural gas, and coal are thought to be derived from dead animals and plant life laid down on ancient seafloors. Later, this organic matter was transformed through the heat and pressure generated by subsequent layers of sedimentary materials. In geological time, the initial deposition of this organic material was a comparatively recent event. All petroleum deposits discovered thus far originated within the last 10% of the earth’s life (from 2 to 400 million years ago) during the Paleozoic, Mesozoic, and Tertiary Cenozoic eras.

**Task 4. Watch the video [www.studentenergy.org/topics/oil](http://www.studentenergy.org/topics/oil) and answer the questions.**

- 1) Name two words that can be used instead of “oil”.
- 2) What do physical properties of oil depend on?
- 3) What trace elements does oil contain?
- 4) When and how were today’s oil deposits formed?
- 5) What is oil sometimes referred to as?
- 6) What is an underground geological formation called where oil is found?
- 7) Give examples of exploration activities mentioned in the video.
- 8) What is the most common way of oil extracting?
- 9) What means are used to transport oil?
- 10) What happens at a refinery?
- 11) Give examples of petroleum products.
- 12) Name two primary uses of oil in the modern world.
- 13) What two types of challenges does oil present and why?

**Task 5. Translate the text in writing.**

Oil is a relatively abundant but is a non-renewable resource. Supplies of conventional oil have been decreasing steadily, making unconventional production more common.

Oil's benefits include its high energy density and versatility. Oil is used to produce products like transport fuels and many other common products. While all these products are important to global society, approximately 71% of global oil consumption is used to enable transportation systems.

The production and use of oil also come with many social and environmental challenges. Producing oil causes land-disturbance sometimes in environmentally sensitive areas, although this varies greatly depending on the production techniques used. The world's oil-powered transportation systems contribute significantly to global greenhouse gas emissions and climate change. Additionally, control and trade of oil resources present many geopolitical tensions between nations and, on a more local level, between stakeholder groups and communities.

## **Text 2**

### **WHAT DOES A PETROLEUM GEOLOGIST DO?**

**Task 1. Can you answer the question in the title? Discuss it with a partner.**

**Task 2. Read the text and check your answers.**

Petroleum Geologists have one task: to prospect for fossil fuels using all the tools at their disposal. Regardless of whether or not the Earth has reached peak oil (and some believe we already have), it is now a competitive market. Some 150 years since we started using fossil fuels in large amounts, the petrochemical industry needs to be more efficient at locating and tapping fossil fuels. That is where the role of a Petroleum Geologist comes in. He or she is a specific type of geologist trained in using scientific methods, examining evidence and following leads that look like potential new sources of oil, and increasingly, gas. They use a wealth of data - survey equipment, geological maps, GIS, cartography, aerial photography for evidence of new pockets. What is clear is that some of our oldest and most reliable pockets are starting to run dry. It is now a matter of principle that we develop technologies to locate and mine

for these resources. We do know that one effect of the global price fluctuation is the increasing difficulty of locating new pockets and mining it. We need to develop new engineering methods to maintain the supply. They typically work in the field and in the lab / office. They are trained in using survey equipment directly, taking geological samples or perform seismic studies. They would then compile a report for other professionals such as teams of petroleum engineers.

<https://www.environmentalscience.org/career/petroleum-geologist>

### **Task 3. Watch the video**

[https://www.youtube.com/watch?v=RRZr\\_d2d3YQ](https://www.youtube.com/watch?v=RRZr_d2d3YQ)

**and answer the questions.**

- 1) What metaphor did Shar use to describe the job of a petroleum geologist?
- 2) What equipment did Shar mention?
- 3) What rock properties do petroleum geologists identify?
- 4) What is the purpose of the described analysis?
- 5) What does Shar mostly use a computer for?
- 6) Who does Shar collaborate with?
- 7) How long does it usually take to finish a project?
- 8) Does Shar work in an office only? If not, where else?
- 9) What does Shar do with samples?
- 10) Does Shar do the analyses or does she have them done?
- 11) What is the minimum requirement to become a petroleum geologist?
- 12) What do you have to have (apart from qualifications) to make a good petroleum geologist?
- 13) What is H<sub>2</sub>S?
- 14) What does Shar do to keep up-to-date?
- 15) What does the phrase “it’s a pat on the back” mean?



**Task 4.** Translate into English.

происхождение	
состав	
прибрежный (шельфовый)	
горная порода	
твердое вещество	
определять	
проводить/выполнять (напр., исследование)	
применение/использование	
ловушка	
углеводороды	
удаленные районы	
мелкий/мелководный	
разведваемый участок	

**Text 3**

**HISTORY OF PETROLEUM INDUSTRY**

**Task 1. Read the text.**

Petroleum has been known throughout historical time. It was used in mortar, for coating walls and boat hulls, and as a fire weapon in defensive warfare. Native Americans used it in magic and medicine and in making paints. Pioneers bought it from the Native Americans for medicinal use and called it Seneca oil and Genesee oil. In Europe it was scooped from streams or holes in the ground, and in the early 19th century small quantities were made from shale. In 1815 several streets in Prague were lighted with petroleum lamps.

Petroleum seeping out of underground reservoirs has been collected and used for light throughout recorded history. In the 4th century A.D. the Chinese drilled for oil and natural gas, but in the 1850s, oil was still being recovered by skimming it off the tops of ponds. As whale oil became less abundant, producers looked for new ways to extract oil. Edwin Drake dug the first modern oil well in Titusville, Pa,

hitting oil at 21.2 m, touching off an oil rush in the area. In 1861 the first oil refinery was set up.

The modern petroleum industry began in 1859, when the American oil pioneer E. L. Drake drilled a producing well on Oil Creek in Pennsylvania at a place that later became Titusville. Many wells were drilled in the region. Kerosene was the chief finished product, and kerosene lamps soon replaced whale oil lamps and candles in general use. Little use other than as lamp fuel was made of petroleum until the development of the gasoline engine and its application to automobiles, trucks, tractors, and airplanes. Today the world is heavily dependent on petroleum for motive power, lubrication, fuel, dyes, drugs, and many synthetics. The widespread use of petroleum has created serious environmental problems. The great quantities that are burned as fuels generate most of the air pollution in industrialized countries, and oil spilled from tankers and offshore wells has polluted oceans and coastlines.

**Task 2. Answer the following questions.**

1. How was petroleum used throughout historical time?
2. Who dug the first modern oil well?
3. When did the modern petroleum industry begin?
4. Kerosene was the chief finished product, was not it?
5. What was the main finished product got from oil?
6. Has the widespread use of petroleum created serious environmental problems?
7. What industries depend heavily on petroleum nowadays?

**Task 3. Retell the text.**

## Text 4

### HISTORY OF OIL PRODUCTION IN THE UNITED STATES

**Task 1. Match the English words/phrases and their Russian equivalents.**

1 oil well	А быть в эксплуатации /работать
2 combined value	В заложить основы
3 crude oil	С стоимость на устье скважины (у места откачки)
4 be in operation	Д зд. произвол, неразбериха
5 annual production	Е совокупная стоимость/величина
6 wellhead value	Ф нефтяная скважина
7 wild exploitation	Г годовая добыча
8 frantic competition	Н хаотичное ценообразование
9 free-for-all	І сырая нефть
10 to center around	Ј яростная конкуренция
11 avarice	К напоминающий что-л.
12 reminiscent	Л неуправляемая/бесконтрольная добыча
13 erratic price structure	М сосредоточиться вокруг чего-л.
14 to lay foundations	Н жадность/алчность

**Task 2. Read the first part of the text.**

In 1859, two oil wells in the United States, with an estimated combined value of \$40,000, produced 2,000 barrels (bbl) of crude oil. More than a century later, hundreds of thousands of wells were in operation in the U.S., with an annual crude oil production of more than 2.3 billion bbl and an estimated wellhead value of more than \$ 35 billion. Between these two points in time, of course, many things happened in and to the petroleum industry. The historical development of the U.S. petroleum industry consists of five distinct stages, described below.

I. A period of wild exploitation began in 1859 when “Colonel” Edwin L. Drake drilled the first commercially successful oil well near Titusville, Pennsylvania. This period, which extended well into the 1870s, was a time of frantic competition, an economic free-for-all centering around production and characterized by a combination of

energy, avarice, and ignorance reminiscent of the Californian Gold Rush days. A highly erratic price structure afforded easy wealth to some and quick ruin to others. Thus, through the successful exploitation of the oil-producing potential of the eastern states, the foundations of a great industry were laid.

**Task 3. Read about the second stage. Translate it in writing.**

II. For 40 years, beginning in 1870 with the formation of the Standard Oil Company (Ohio), the entire activity of the petroleum industry was dominated by the Standard Oil Group. During this period, the Standard Oil group controlled many of the refining, transportation, and marketing functions of the industry, thereby assuring price control of the fourth principal function, production. By the early 1880s the Standard Group controlled 80-90% of all U.S. refineries. By 1904, the Standard distribution system – a vast network of railroads, pipelines, bulk plants, and affiliated marketing outlets – extended into most states. Close to 90% of all U.S. petroleum dealers at that time bought from the Standard Oil group.

**Task 4. Read the third part of text. Fill the gaps with the words from the table below.**

1	emergent	emergency	emergence
2	stage	step	base
3	reservoir	capacity	demand
4	invented	depended	invested
5	designed	developed	delivered
6	specializing	doing	researching

III. The dissolution, between 1911 and 1915, of the Standard empire restored competition, resulting not only in the (1)\_\_\_\_\_ of many new companies but in a continuation of the search for security, through integration, by the “major” oil companies. This third historical (2)\_\_\_\_\_ is sometimes called the modern era of petroleum industry.

As competition was restored and oil (3)\_\_\_\_\_ increased during World War I, the petroleum industry expanded to meet the burgeoning requirements of the U.S. industry and all the newly developed means of

land, sea and air transportation that (4)\_\_\_\_\_ upon petroleum products for fuel and lubrication. A period of remarkable activity resulted and an enormous and complex industry (5)\_\_\_\_\_, ranging from massive integrated firms operating worldwide to single-individual enterprises (6)\_\_\_\_\_ in one facet of exploration, production, or retail distribution.

**Task 5. Read the fourth part of text and answer the questions below.**

IV. The 1930s brought the Great Depression and government regulation of production, which has continued ever since as a significant political and economic fact of life for the petroleum industry. The petroleum industry's chief troubles usually have arisen from overproduction: too much output, too little demand, too low a price, too little profit.

This was also the period in which liquefied petroleum gas (LNG) and natural gasoline, previously considered field waste products, started to come into their own, for former largely as heating fuel and the latter as a blending agent for the new "composite" gasolines.

- 1) What economic changes happened in the US in the 1930s? What do you know about it?
- 2) What impact did the Great Depression make on the petroleum industry?
- 3) What were LNG and natural gasoline used for?

**Task 5. Read the last part of the text and translate it in writing.**

V. After World War II, a period of competitive realignment in the late 1940s and early 1950s found some U.S. companies with substantial foreign crude oil resources and others almost exclusively dependent on domestic production. In this period, the U.S. petroleum industry, slightly tinged with an international flavor almost from its inception, became truly worldwide in its relationships and correspondingly more sensitive to international political and economic developments.

In the same stage the natural gas industry developed remarkably. Natural gas trunk lines, often 2,000 miles or more in length, began to move enormous quantities of a standardized product to consuming centers throughout the nation.

## Text 5

### HISTORY OF OIL PRODUCTION IN RUSSIA

**Task 1. Look though the text and write down methods that were introduced into the oil production in Russia in 1859-1975.**

**Task 2. Go through some words from part 1, study unknown words.**

rank – давать оценку, подсчитывать

gusher – нефтяной фонтан, мощный выброс нефти из скважины

initial yield – первоначальная рентабельность, начальный объем

bailing – тартание, откачивание

bottom-hole centrifugal electric pumps – забойный центрифугальный электрический насос

CPSU – Communist party of the Soviet Union

ASSR – Autonomous Soviet Socialist Republic

casinghead gas – попутный газ, нефтяной газ

**Task 3. Read and translate the text.**

#### Part 1

Petroleum Industry - the branch of heavy industry that includes exploration of oil and gas deposits, well drilling, extraction of oil and casinghead (by-product) gas, refining of casinghead gas, and pipeline transportation of petroleum. The advent of mechanical drilling of oil wells (USA, 1859) is regarded as the beginning of the development of the petroleum industry.

In Russia the first wells were drilled by A. N. Novosil'tsev in the Kuban' region in 1864, and in 1866 one of the wells, on the Kudako River, produced a gusher with an initial yield of more than 190 tons per day. The petroleum monopolies in Russia, which depended mainly on foreign capital, exploited the richest oil deposits. Mechanization of petroleum production during this period was minimal. In the early 20th century, Russia ranked first in the production of oil; maximum production in 1901 was 11.9 million tons.

After the nationalization of Russia's petroleum industry in June 1918, the Soviet government took extraordinary measures to restore the enterprises destroyed during the Civil War of 1918–20. At that time, oil production was concentrated mainly in the old oil regions of Azerbaijan (Baku) and the Northern Caucasus (Groznyi and Maikop). Improvements in drilling and production technology and equipment took place along with the restoration of the petroleum industry. Rotary drilling gradually replaced the less efficient cable tool drilling. Bailing was replaced by deep-well pumping operations and by the compressor-lift (injection) method. Oil prospecting expanded in other regions of the country during the early five-year plans. Oil fields were discovered and put into operation in Perm' Oblast, the Bashkir ASSR, and Kuibyshev Oblast, which brought about the development of a new, major oil-bearing region of the USSR, the "Second Baku." New oil deposits were discovered in Middle Asia and the Kazakh SSR. By 1940 oil production had reached 31.1 million tons. During the Great Patriotic War (1941–45) oil production was curtailed because of war damages in the Northern Caucasus. The major oil fields of the Volga-Ural Oil-Gas Region were discovered and put into operation in the postwar period.

The next stage in the development of the Soviet petroleum industry was associated with the widespread use of systems of oil field development with maintenance of formation pressure; such systems, together with the discovery of new oil deposits, made possible a considerable increase in oil production (from 37.9 million tons in 1950 to 147.9 million tons in 1960). Technical reequipment of the entire sector was implemented (new drilling rigs, roller bits, turbodrills, and bottom-hole centrifugal electric pumps were designed and introduced; industrial borehole construction methods were developed), making possible a twofold increase in labor productivity in 1972 as compared with 1960. The CPSU's policy of advanced development of the oil and gas industry and of an increase in its role in the nation's fuel-energy balance brought the USSR into second place (after the USA) among the world's oil-producing countries in 1961. By 1972 oil accounted for 42.3 percent of fuel production.

The rapid growth resulted from the introduction of large new fields into operation, both in previously developed oil areas and in new regions (Western Siberia and offshore areas of Azerbaijan; Western Kazakhstan, Byelorussia, Orenburg Oblast, and the Udmurt ASSR). Of particular importance was the discovery of a unique oil and gas basin in Western Siberia, which has become associated with the creation of the largest oil-gas producing region in the USSR (the Western Siberian Oil and Gas Basin).

Great success was achieved in the introduction of integrated automation of oil production, including tens of thousands of producing wells and all oil field facilities. Casinghead gas, a valuable raw material for the petrochemical industry, was extracted as a by-product in the recovery of oil. In the USSR, the production of casinghead gas alone rose from 7.7 billion cu m in 1960 to 26.5 billion cu m in 1973. Petroleum was transported within the USSR by a network of trunk pipelines, which connect all major oil regions with oil refineries and with industrial areas and centers of the country.

**Task 4. Speak about the development of petroleum industry in Russia and the Soviet Union in the periods:**

- 1864-1901
- 1918-1945
- 1950-1973

**Task 5. Scan part 2 and find English equivalents of the following words and expressions.**

резкое падение добычи нефти	
выработать скважину	
месторождение	
вертикально-интегрированные подразделения	
препятствовать	
внутренняя цена	
удовлетворить спрос на внутреннем рынке	
заявить свои права на что-либо	



**Task 5. Read and translate the second part of the text.**

**Part 2**

Russia ranks third in the world in oil production, after Saudi Arabia and the United States. Estimates place proven and potential oil reserves at 8 to 11 billion tons. Russia's oil production peaked in 1987, and then began a decline that continued through 1995. In the latter year, the yield was 741 million barrels, 13 million barrels less than the previous year. Output for the first quarter of 1996 was 182 million barrels.

Wasteful Soviet oil exploration and extraction techniques depleted wells, which often fell far below their potential capacity. Soviet technology was not capable of exploring and extracting as deeply and efficiently as Western technology. In 1994 the number of oil wells drilled was only one-quarter the number drilled in 1983. About two-thirds of Russia's oil comes from Siberia, mostly from huge fields in the northwest part of the region. The main European oil and gas fields are located in the Volga-Ural region, the North Caucasus, and the far north of the Republic of Komi.

Russian oil companies are vertically integrated units that control the entire production process from exploration to transmission. The largest company is Lukoil, which, according to some measurements, is the largest oil company in the world. The dominance of a few large companies has made all stages of petroleum exploitation and sale extremely inefficient. National and local government policies have discouraged individual retailers from establishing independent gasoline storage facilities and stations; therefore, retail gasoline likely will continue to be in very short supply (only 8,900 stations were operating in Russia in 1995). Both policies, resulting from the gap between controlled domestic prices and world market prices, aimed at ensuring a sufficient supply of oil to meet domestic demand; both were lifted as the gap narrowed.

The search for new oil deposits was a primary force in Russia's foreign policy toward states to the south. Russia staked its claim for the Caspian oil reserves that Western companies were exploring in conjunction with Azerbaijani, Turkmenistani, and Kazakhstani state companies. The presence of Western interests and the strong role being played by Iran and Turkey, Russia's traditional regional rivals, complicated this policy, which aimed to achieve maximum benefit from Russia's position on the shore of the north Caspian.

**Task 6. Use internet resources and prepare a short report about the development of oil industry in Russia in the 21 century.**

### **Text 6**

#### **7 AMAZING FACTS ABOUT THE OIL INDUSTRY**

**Task 1. Read the text. Was there anything new or amazing? Discuss it with your partner/group mates.**

You depend on it every single day but how much do you really know about the oil industry? Perhaps after reading the following facts, you'll start to think you did not know as much as you thought you did. Did you know...?

#### **... An Oil Reservoir is Not a Giant Underground Pool**

Contrary to widespread belief, an oil reservoir is not a giant pool of liquid beneath the ground that can easily be sucked onto the surface. Rather, the oil is trapped in the pore spaces between rock crystals and soil grains.

Think of an oil reservoir as a giant sponge soaked in oil. It all comes down to how oil is formed i.e. the burial, compression and heating of dead organisms underneath sedimentary rocks over millions of years.

#### **... Mud is a Cleaner**

Mud is usually viewed as undesirable and is associated with filth. Not so in the oil industry. Think of how the sawing of wood produces sawdust. Something similar happens when you are drilling a hole in the

ground. Countless rock chippings are produced. You can easily blow away sawdust but how do you deal with loose material far below the ground? By mixing clay and water in predefined proportions, a drilling mud is created that is pumped down the hole. It carries the loose chippings with it.

### **... 40 Percent of the World's Ocean Cargo is Oil**

That's massive. It's hard to appreciate the sheer scale of the oil industry but this one statistic goes a long way in painting a picture. It is this gargantuan\* size and the massive infrastructure built around it that has made it extremely difficult to find a worthy replacement to power the world. We are still many years away from solar power for instance taking the place of oil. That's even before factoring the numerous non-energy uses of petroleum products.

*\*Garganruan - The Life of Gargantua and of Pantagruel is a novel written in the 16th century, which tells of the adventures of two giants, Gargantua and his son. The text is written in an amusing, extravagant, and satirical vein, and features much crudity, scatological humor, and violence.*

### **... Oil Rig Workers are Highly Skilled and Paid**

It's a dirty and physically exerting job. No college education is required. Yet oil rig workers are better paid than the vast majority of professions. In 2011, the average oil rig worker's annual pay was nearly US\$100,000.

The junior-most role on a rig (a roustabout) averaged US\$34,680, roughly the median pay of all workers in the US. Oil rig workers are highly paid by any measure. However, the pay must be placed in context. Rigs are a dangerous work environment. Workers also spend extended periods away from family and friends.

### **... Most of the World's Oil is Unlikely to be Recovered**

Much of the world's oil will probably never be recovered. The term 'oil reserves' refers to the amount of oil in a reservoir that can be technically and economically extracted. The recoverable oil usually ranges anywhere between 10% and 60% of the reservoir.

So why is such a large proportion of the oil virtually impossible to extract? It comes down to rock permeability, natural pressure and the oil's viscosity. While there have been major technological advances (fracking is one), it's hard to see a mechanism for extracting all or most oil from the ground in the foreseeable future.

### **... Oil Has Much Broader Use Than Motor Vehicles, Aircraft, Power Plants and Domestic Heating**

Oil has extensive application in the pharmaceutical and medical industry. Oil products are also used in the textile industry particularly in the making of synthetic fabrics such as acrylic, vinyl, nylon and polyester.

It is used in the manufacture of plastics that form camping gear, sports gear, toys and electronics such as computers, tablets, smart phones and televisions. It is a key component in the building of ships, trains and plane parts. Petroleum products are a component in the synthesis of fertilizers, bubble gum and perfumes.

### **... Fire isn't the Primary Cause of Workplace Deaths in Oil and Gas Extraction**

Surprising isn't it? Considering an oil rig is built around gigantic quantities of combustible material, you would think fires would be the biggest killer. Yes, as several tragic incidents over the years have shown, an uncontrollable fire is the last thing you need on a rig. Fortunately, decades of perfecting safety procedures has seen a significant reduction in deaths or injuries from 'big' risks. In 2015, the number one cause of death on an oil rig was being struck by a falling object. In 2015, deaths from fires and explosions accounted for less than 20% of workplace fatalities in the oil and gas extraction industry.

These 7 facts barely scratch the surface on the surprising information around the oil and gas industry. It does however provide a peek into just how much stuff outsiders might not know.

**Task 2. Choose the most interesting fact and translate it in written.**

**Text 7**  
**OFFSHORE DRILLING**



**Task 1. What do you know about offshore drilling? Is it more challenging than land-based installations? Discuss in groups.**

**Task 2. You will watch a video about offshore drilling. Translate the words and phrases from the video.**

consult with stakeholders	
avoid impact	
hazards associated with	
obtain approval	
assess the condition	
drill bit	
conductor	
top hole	
casing	
blowout preventer	
seal a well	
release of fluids	
targeted reservoir	
total depth	
drilling fluid/mud	

lubricated	
rock cuttings	
geological properties	
rock and fluid sampling	
well abandonment	

**Task 3. Read the questions below. Watch the video <https://www.youtube.com/watch?v=DmOZEt9DwRE> and answer the questions.**

- 1) What are the main uses of hydrocarbons?
- 2) What does Woodside company do? Where is it based?
- 3) How old is Woodside?
- 4) How many offshore wells has the company drilled? Where are they?
- 5) What activities does Woodside undertake before drilling?
- 6) Why is it important to interact with locals?
- 7) What are environmental plans aimed at?
- 8) What two ways of drilling a well are mentioned?
- 9) What measures are taken to ensure safety?
- 10) What is a safety exclusion zone?
- 11) What stands for ROV? What is it used for?
- 12) What is a conductor?
- 13) Why is casing necessary?
- 14) What does BOP stand for? Where is it installed?
- 15) Explain what total depth is.
- 16) What is the purpose of drilling fluid (mud)?
- 17) What tests are run when total depth is reached?
- 18) Explain what well abandonment is.

**Task 4. The texts below are similar to those in the exam. Translate them allowing 30 minutes for each. All the texts are about offshore drilling.**

1) Offshore drilling is the process of extracting petroleum from reserves located beneath the Earth's oceans instead of reserves located on the mainland. Offshore oil rigs have developed greatly over the past years, and have become gigantic structures that

house hundreds of people at a time. Some facilities sit on towers that go to depths of 1220 meters below the surface, larger than any skyscraper ever conceived of.

Recently, offshore drilling has increased in popularity as a result of the large amount of oil and other petroleum products used worldwide each day. To meet the demand for fossil fuels, petroleum companies are faced with the task of searching in more remote locations to discover new reserves. Since oceans cover almost 3/4ths of the Earth's surface, a large amount of the oil and natural gas reserves around the globe are located beneath water.

2) The process of drilling for oil and natural gas underseas is much more challenging than drilling on land. Extraction, transportation, and environmental protection are all comparatively more difficult with offshore drilling than with traditional wells. In an attempt to make this process more simple, petroleum companies have developed offshore oil platforms to aid in this extraction.

Once the offshore drilling platform is built, some method of extracting the oil and gas from beneath the ocean and moving it to the surface without losing it must be developed. To drill without water flowing into the hole or having all the oil surge up into the ocean, a subsea drilling template is used. This template is simply a large metal box with holes in it that is used to guide the drilling process and marks the site of each production well.

3) Once the locations of the drilling sites are marked with this template, the drilling process can begin. To drill these wells, a number of 9 meter drill pipes are connected to form a large drill string used to reach deep into the Earth's crust. Once connected, this string of drill pipes is connected to a device that spins it around, and using the drill bit connected at the bottom of the drill string the pipes grind down into the Earth's surface. This drilling process can take a long period of time, lasting anywhere from weeks to months. During this time, if the bit becomes dull and needs replacement the equipment is moved to the ocean

floor in a tube known as a marine riser. As the borehole moves deeper into the ground, a stream of drilling mud is sent to the drill bit, and then moves back up to the platform. This mud is vitally important to the drilling process as it provides lubrication for the drill bit, seals the wall of the well, and controls pressure inside of the well.

4) Any rock particulates broken off during the drilling process are brought up to the surface, suspended in the drilling mud. A filtration system on the platform filters the mud before sending it to the ocean floor again. Drilling itself happens in phases, with a length of the well drilled and then lined with metallic casing. Each phase of drilling creates a portion of the well with a smaller diameter, each portion lined with casing. Once drilled and cased, a packer is sent down the well which expands and ensures the well is sealed.

Although drilling mud helps to control the high pressure experienced when drilling, there is a significant risk of blowout. To prevent this from occurring, drilling rigs are equipped with a blowout prevention system on the seafloor. These systems act by sealing the well with hydraulic rams if pressurized petroleum pushes up the well, moving expelled fluids into containment systems to prevent pollution.

## Text 8 RUSSIAN OFFSHORE PROJECTS

**Task 1. Watch the video about the Prirazlomnaya platform**  
<https://www.youtube.com/watch?v=d9dyjr8LAWw&feature=youtu.be>  
**and make notes. Use them as a plan to talk about the platform.**

**Task 2. Read the text about the Prirazlomnaya platform and fill the gaps with the correct word from the table.**

1	deposit	field	area
2	facility	capacity	assets



3	designed	loaded	worked
4	supplies	invites	meets
5	avoid	prevent	minimize
6	entered	came	went

The Prirazlomnoye (1)\_\_\_\_\_ is currently the only Russian hydrocarbon production project implemented on the Arctic shelf. The Prirazlomnaya offshore ice-resistant oil-producing platform is the field's main (2)\_\_\_\_\_. The Prirazlomnoye oil field was discovered in 1989. It is located on the Pechora Sea shelf 60 kilometers off the shore (Varandey settlement) at a water depth of 19 to 20 meters.

Prirazlomnoye contains over 70 million tons of oil, with a potential production level of some 5.5 million tons per year. The Prirazlomnaya offshore ice-resistant oil-producing stationary platform was built specifically for the Prirazlomnoye field. The platform is used for all production operations, including oil drilling, extraction, storage, treatment, and offloading. As it was (3)\_\_\_\_\_ for the Arctic region, Prirazlomnaya can be used in extreme weather conditions; it (4)\_\_\_\_\_ the most stringent safety requirements and can withstand the highest ice loads. The wellheads of all wells to be drilled at the field are located within the platform, while its foundation serves as a buffer zone between the well and the open sea. In addition, the equipment installed at the wells is meant to (5)\_\_\_\_\_ blowouts of oil or gas. The offloading line used for transferring oil to tankers is provided with an emergency shutdown system that can be activated instantly. Round-the-clock monitoring of the Prirazlomnaya platform is ensured through a special system with over 60 detectors tracing the changes in its operation.

The new type of oil produced at the Prirazlomnoye field was named ARCO (Arctic Oil). It (6)\_\_\_\_\_ the global market in April 2014. ARCO is characterized by high density (about 910 kilograms per cubic meter), an increased concentration of sulfur, and low paraffin content. ARCO is well-suited for deep processing in northwestern Europe, as it is rather heavy compared to the standard Russian export oil. It serves

as the basis for unique chemical products that can be used in road-building, rubber tire manufacturing, the space industry, and pharmaceuticals.

### **Task 3. Read and translate the text about Lukoil's Kravtsovskoye (D-6) Oil Field.**

Lukoil's Kravtsovskoye (D-6) oil field is located in the Russian sector of the Baltic Sea. It was discovered in 1983 at a distance of 22.5 km from the coast of Kaliningrad region. The depth of the water is 25m to 35m. The **initial exploration drilling** followed a **geological survey** by Lukoil-Kaliningradmorneft. This confirmed that oil reserves of the C1+C2 categories at Kravtsovskoye were estimated to be 21.5 million t. **Recoverable reserves** were put at 9.1 million t.

The development is being carried out from an offshore ice-resistant stationary complex manufactured at Kaliningradmorneft steelworks. This is the first production platform in the Russian offshore sector to be designed and manufactured domestically. It has been designed to resist 0.3m-thick ice and survive 9m storm waves.

#### **Kravtsovskoye Offshore Development**

The development complex consists of two platforms, 11m above sea level, bridge-linked by a 70m walkway. One contains the living quarters, including a helideck, accommodation, eating area, swimming pool and sauna, while the other contains the process and drilling system. 27 wells are planned to be drilled at the field. The **average depth of production wells** will be 2,160m. The first well came on stream in summer 2004. The field is expected to last between 30 and 35 years.

#### **Coastal Underground Pipeline**

The offshore facilities are connected to the Romanovo oil-gathering unit on the **mainland** via a 273.1mm-diameter, 47km-long underwater pipeline. The pipeline has two types of protection: active (it is protected by anodes provided by the Norwegian company Jotun) and

passive (a three-layer **outer coating**). Part of the pipeline lies in an underwater trench and is protected from waves by special constructions. The safety of the pipeline's 'technological chain' is ensured by a **reliable** control system. The junction of the offshore and onshore parts of the pipeline is equipped with a stop-valve gate for immediate pipeline blocking.

### **Oil-Gathering Unit and Oil Terminal**

The coastal underground pipeline consists of two parts. The first part (6.15km long) is an oil pipeline from the **stop-valve gate** to the oil-gathering unit at Romanovo. The second part (31.6km long) connects the underground pipeline from the oil-gathering unit and the Izhevsky oil terminal. The underground pipeline **is equipped with** an electrochemical corrosion protection system.

**Task 4. Add the words and phrases in bold to your vocabulary list and learn them. Work with a partner and test each other.**

## **Text 9 HEBRON PROJECT**

**Task 1. Read about Hebron project.**

The Hebron oil field is located offshore Newfoundland and Labrador, Canada in the Jeanne d'Arc Basin 350 kilometres southeast of St. John's.

The field was first discovered in 1980, and is estimated to produce more than 700 million barrels of recoverable resources. The water depth at the Hebron field is 93 metres (Mean Sea Level).

The Hebron field is being developed using a stand-alone concrete gravity based structure (GBS). The GBS consists of a reinforced concrete structure designed to withstand sea ice, icebergs and meteorological and

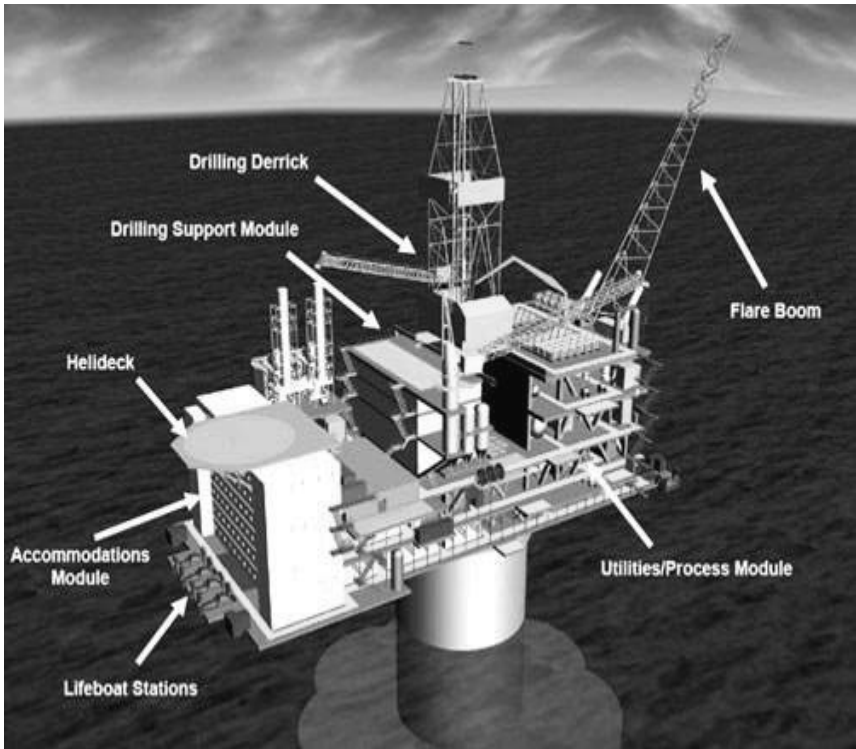
oceanographic conditions. The GBS is designed to store approximately 1.2 million barrels of crude oil.

The project includes offshore surveys, engineering, procurement, fabrication, construction, installation, commissioning, development drilling, production, operations and maintenance and decommissioning.

Hebron is a major project that is delivering significant benefits to Newfoundland and Labrador: engineering, fabrication and construction, employment and training of a diverse workforce, research and development opportunities, along with significant royalty and tax revenues.

**Task 2. Speak about Hebron project using the plan and the picture below.**

- 1) General information (location, discovery, water depth)
- 2) Platform design
- 3) Project constituents
- 4) Benefits for the locals



## Text 10

### **KAOMBO: AN INNOVATIVE ULTRA-DEEP-WATER OFFSHORE PROJECT IN ANGOLA**

**Task 1. Skim the text and say why the project is regarded innovative.**  
**Task 2. Translate the bold words and add them to your vocabulary list.**

Launched in April 2014, Kaombo is the first project on ultra-deep offshore Block 32, located off the Angolan coast. With 658 million barrels of **estimated oil reserves** situated at depths of up to 1,950 meters

and spread across 800 square kilometers, Kaombo is one of Total's greatest technical feats ever.

### **An extraordinary technical challenge**

The Kaombo project is located in Block 32, a concession that Total operates with a 30% stake. Its aim is to tap into the oil deposits spread across six fields connected via 300 kilometers of subsea pipelines to two **Floating Production, Storage and Offloading (FPSO) vessels**: Kaombo Norte and Kaombo Sul.

This massive, complex project has some unique characteristics:

First, the water depths involved, which reach up to 1,950 meters. The extreme temperature and pressure conditions at such depths require the use of technology that is both reliable and **cost-effective**. Given these unprecedented depths, the Kaombo project is perfectly aligned with Total's strategy of rising to the challenge of ultra-deep offshore.

Second, Kaombo's reserves, which are estimated at 658 million barrels, for a **production capacity** of 230,000 barrels per day (b/d).

Third, the project's particularly complex production system. In order to tap into oil deposits spread across six fields, covering a surface area of 800 square kilometers, Kaombo required the installation of 59 wells, making it the largest subsea well system in Angola for a single project. Some 300 kilometers of subsea pipelines now enable the six groups of reservoirs to be tied back to two FPSO units.

### **Converting oil tankers into FPSO vessels**



In an effort to control costs and in line with its policy of **continuous improvement**, Total decided not to build new FPSO vessels for this project. Instead, two oil tankers were **converted** into FPSO units with internal turret - this central structure is the nerve center of the FPSO-, a first for Total. The first FPSO, Kaombo Norte, which started production in July 2018, develops three of the six fields and the second FPSO, Kaombo Sul, which produced first oil eight months later, operates on the other three. Each vessel produces and **stores** up to 115,000 barrels per day.

This unique infrastructure and the extensive expertise channeled into the project make Kaombo a showcase for innovation.

### Task 3. Translate into English

уровень добычи	
плавучая система для добычи, хранения и отгрузки нефти	
рентабельный, экономически выгодный	
прогнозный, оцененный	
постоянное улучшение, совершенствование	
реконструировать, преобразовывать	
хранить	

**Task 4. Watch the video about Kaombo project. Write down key words while watching. After watching the video make a plan of the story using the keywords and speak about the project.**

## **Text 11 LIFE ON AN OIL RIG**

**Task 1. Do you have an idea what it is like working on an offshore rig?**

**Watch the video**

**<https://www.youtube.com/watch?v=PCGeQdZpO6A> ,  
make notes and discuss your impressions with a partner.**

**Task 2. Read the blog and translate it.**

An offshore oil rig, a floating city on the ocean, is a city that never sleeps. Though you must have heard about the life on this wonderful floating platform, there are few things you might not be aware of. The first and foremost thing is to note that life on an oil rig is not all partying and gambling. It is in fact a gamble with one's own life in trade for the dreaded death. Though the sentence might sound a bit exaggerated, it is not all untrue, for one constantly encounters deadly conditions while offshore on an oil rig.

Five thousand years ago was a time when demand for oil was much more than the supply of the same. Besides collecting the oil seeping through land oil wells, companies in the oil industry started exploring beyond and developed drilling of crude oil below the sea bed. It was in Gulf of Mexico that the open waters gained their first oil well structure. News spread and ever since new fields have been discovered including in the Scottish waters and the North Sea.

### **The Life on an Oil Rig**

Life changes dramatically for the one who decides to step foot to work in this industry. Earlier life on an offshore oil rig was arduous and difficult but there has been a significant change and improvement in the



living conditions. One needs to get outfitted to start work on the rig and hence safety glasses, hard hats, coveralls and steel-toed boots are issued on arrival. Regular safety trainings are given before and during employment. The work designated to a rig worker usually falls on an 8-12 hour shift with breaks for food in the morning, noon and night. One might have to do night shifts since this industry operates 24 hours a day and 7 days a week, but a two-week work on the rig will earn the worker a holiday of almost three weeks.

While on aboard a rig, one need not worry about the food or laundry or accommodation. Rooms with bunk beds are a common sight where one gets a womb-like feeling with the slight swaying of the rig while sleeping. Cinema, televisions in every room, gymnasium, indoor sports facilities like table tennis, computers with internet links are some other added benefits one enjoys on the rig along with the handsome payment earned for the work.

Despite all this, the one major risk of undergoing near death experiences every now and then on aboard the rig, is more than enough to defy all the enjoyment one can have. The environment of the rig is pretty hostile as nature of operation of work involves regular occurrence of tragedies and accidents. Fluids that are flammable are drawn out of the earth, some of which is burnt in flames to separate poisonous sulfide gas from the same. Dangerous machinery are operated and work is even carried out at tall heights despite of whatever the climatic condition is, be it even stormy or windy.

Be it for a worker on the rig or off rig workers like the paramedics, housekeepers, and caterers, etc., life on an oil rig falls into a situation of dilemma to choose for, since it involves the greatest of risks while providing equally tempting benefits of life.

**Task 3. Work in small groups. Discuss pros and cons of working on an oil rig.**

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# **АНГЛИЙСКИЙ ЯЗЫК ДЛЯ НЕФТЯНИКОВ**

*Методические указания к практическим занятиям  
для студентов специальности 21.05.06*

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