НЕФТЕЮГАНСКИЙ ИНДУСТРИАЛЬНЫЙ КОЛЛЕДЖ

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**ПРАКТИЧЕСКОЕ ПОСОБИЕ**

**по учебной дисциплине**

**ИНОСТРАННЫЙ ЯЗЫК**

**для обучающихся 3 курса**

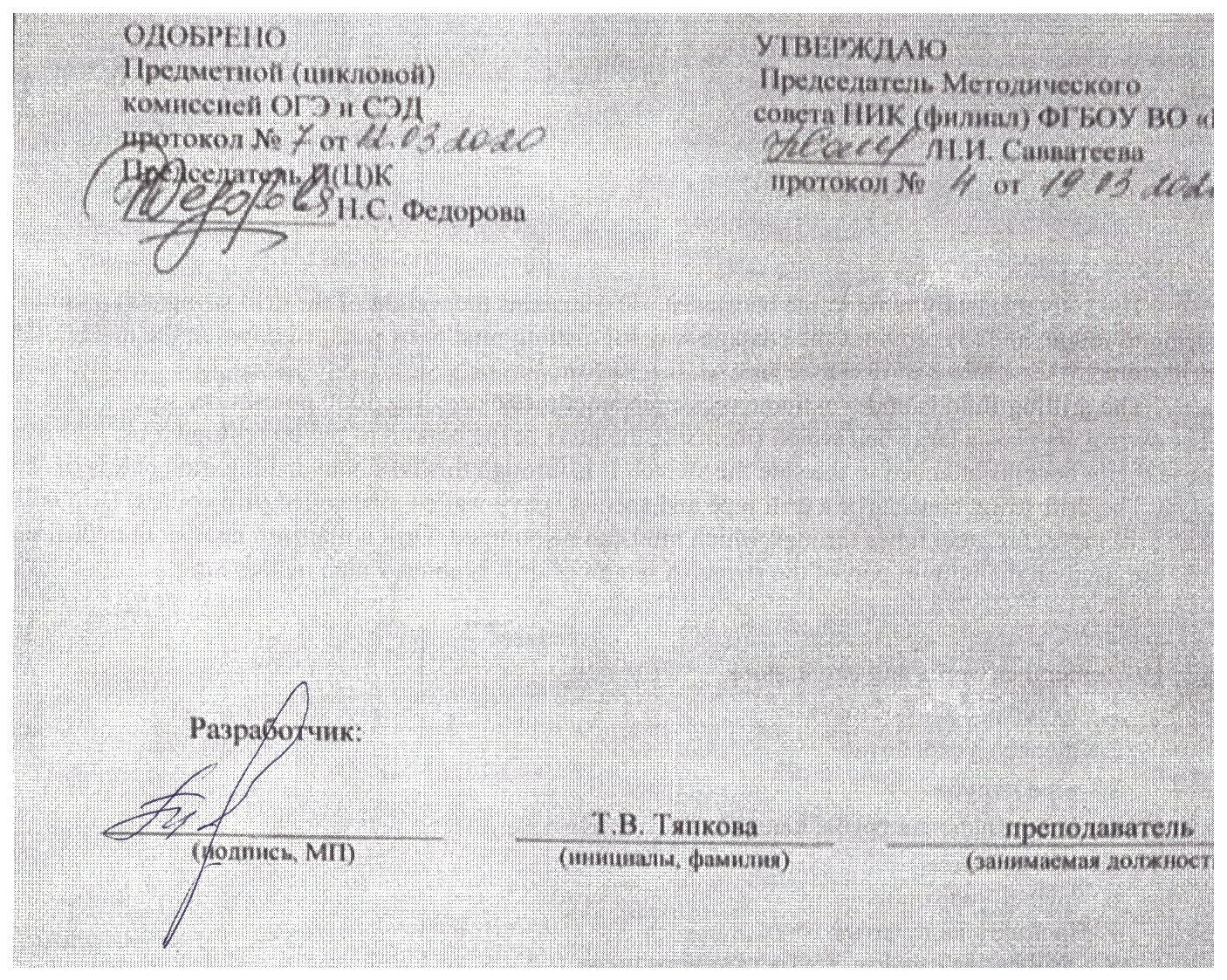
**по** **специальности**

15.02.01 «Монтаж и техническая эксплуатация промышленного оборудования

(по отраслям)»

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**ПОЯСНИТЕЛЬНАЯ ЗАПИСКА**

Практическое пособие предназначено для обучающихся 3 курса специальности 15.02.01 «Монтажи техническая эксплуатация промышленного оборудования (по отраслям)».

*Цель настоящего пособия* – формирование навыков работы с иноязычными текстами, навыков перевода, извлечения информации и её переработки на основе различных видов чтения, расширение активного и пассивного словарного запаса в профессиональной области. Учебное пособие позволяет решать следующие *задачи* на занятии иностранного языка:

* совершенствование процесса качественного произношения слов;
* введение и закрепление лексики;
* работа над грамматикой;
* совершенствование навыков устной речи.

Специальная лексика вводится тематически, закрепляется в разнообразных упражнениях. Пособие состоит из 7 заданий, которые включают в себя следующие задания:

* прочитать и перевести текст;
* дать ответы на вопросы к тексту;
* заполнить пропуски подходящей по смыслу лексикой;
* составить монологические и диалогические высказывания по предлагаемым для обсуждения темам с обязательным использованием лексики занятия.

Разработанные упражнения предназначены для организации адекватного понимания содержания текстов.

Задания, представленные в пособии, могут использоваться в качестве дополнительного материала как в ходе самостоятельной работы обучающихся над иностранным языком, так и на практических занятиях под руководством преподавателя.

Задание № 1

Rig Components.

Oil and gas production begins with a construction of a well or drilling operation. There are some methods of drilling, but rotary drilling is almost always used in industry. Making holes with a rotary rig requires not only qualified personnel, but a lot of equipment as well. In order to learn about the components it is convenient to divide them into four main systems: power, hoisting, rotating and circulating.

Practically every rig uses internal combustion engines as its prime power source, or its prime mover.

Every rig must have a hoisting system, which is made up of draw works (hoist), a mast or a derrick, the crown block, the travelling block and a wire rope.

Masts and derricks have to be as strong as possible. On a deep well the string may weigh as much as 225000 kilograms (that’s 225 tones). Manufacturers of derricks and masts usually rate their products in terms of vertical loads they can carry and the wind load they can withstand from the side. Derrick or mast capacities for vertical loads, vary from 100 up 700 tones. Most derricks and masts can withstand a wind load of 160 to 210 kilometres per hour.

**Exercise**s

1. Remember words and expressions.

1. oil and gas production - добыча нефти и газа

2. well - скважина

3. hole - скважина, отверстие

4. rig - установка

5. to require - требовать

6. a lot of - много

7. convenient - удобный

8. to divide - делить

9. main - главный

10. power - мощность, энергия

11. hoisting system - талевая система

12. to rotate - вращать

13. internal combustion engine - двигатель внутреннего горения

14. source - источник

15. mover - двигатель

16. traveling block - передвижной блок

17. wire rope - трос

18. mast - мачта

19. derrick - вышка

20. string - колонна

21. to rate – оценивать, классифицировать

22. load - нагрузка

23. to withstand - выдерживать

24. side - сторона

25. drawworks - лебедка

26. capacity – мощность, нагрузка

2) Read through the text quickly, aiming for a general grasp.

3) Find answers to the following questions.

1. What is the first step in oil and gas production?

2. What method of drilling is the most popular in oil and gas industry now ?

3. What must every rig have?

4. Why do masts and derricks have to be as strong as possible?

5. What do the figures 100 up to 700 tonnes mean?

4) Read and translate the text.

5) Сomplete the following statements.

1. Making holes with rotary rig requires not only qualified personnel, but … as well

2. Everyrig uses internal combustion engines as its ... ,

3. Masts and derricks have to be … .

4. Drilling equipment is divided into four main systems: ... .

5. On a deep well the string may weigh ... .

6)Say in English:

Бурение, вышка, мачта, установка, двигатель, основной двигатель, трос, колонна, добыча, энергия, нагрузка.

Начинать, бурить, требовать, делить, узнавать, весить, оценивать, выдерживать, изменяться.

7) Translate into English using "there is...», "there are...».

1.Cуществует несколько способов бурения.

2. На каждой буровой есть талевый блок.

3. На нашей буровой есть новая установка.

8) Find equivalents in the text.

l. Мачты или вышки должны быть как можно прочнее.

2.Большинство буровых могутвыдержат ветровую нагрузку

3. В глубокой скважине колонна может весить ... .

4.Каждая вышка должна иметь талевую систему.

9) Answer the questions:

1.Is drilling the first step in oil and gas production?

2. **How** many methods of drilling exist?

3. What systems are there in drilling equipment?

4. What is the prime power sourse in every rig?

5. What does hoisting system consist of?

6. Why do masts and derricks have to be as strong as possible?

7. How much may the string weigh?

8. Is it important to know everything about drilling equipment for future oil engineer?

10)Translate.

1. Добыча нефти и газа всегда начинается со строительства скважины.

2. Роторное бурение требует использования большого количества оборудования

3. Существуют 4 основные системы: энергетическая, талевая, вращательная и циркуляционная.

4.Талевая система состоит из лебедки, мачты или вышки, кронблока, талевого блока и троса.

5. Вес колонны составляет 225 тонн.

6. Вышка должна выдерживать вертикальную и ветровую нагрузку.

Задание №2

Rotating Equipment

Rotating equipment from top to bottom consists of a device known as swivel, a short piece of pipe called the kelly, the rotary table, the drill string and the bit.

The assembly of members between the swivel and the bit, including the kelly, drill pipe and drill collars, is termed the drill stem.

The Swivel.

The swivel is trully remarkable because it - (1 ) sustains the weight of the drill string; (2) permits the string to rotate; and (3) provides the passage way for drilling mud to be pumped down in the inside of the drill stem.

The drilling fluid is under extreme pressure sometimes exceeding 3000 pounds per square inch (psi). The swivel also has a large bail which fits inside the hook at the bottom of the travelling block. The rotary hose (kelly hose) is attached to the side the swivel. It is through this hose that drilling mud enters the swivel.

The drill string consists of a drill pipe and special heavy walled pipe called drill collars. Drill collars, like drill pipes, are steel tubes through which mud can be pumped. Drill collars are heavier than drill pipes and are used on the bottom part of the string. A length of drill is about 9 nine metres long.

Exercises

1. Remember words and expressions.
2. to consist of - состоять
3. device - устройство
4. pipe - труба
5. kelly - рабочая труба, квадрат
6. bit - долото
7. swivel - вертлюг
8. include - включать
9. drill collar - муфта, труба тяжелого низа
10. drill stem - штанга
11. to sustain - выдерживать
12. to permit - позволять
13. to provide - снабжать, обеспечивать
14. passage way - проход
15. to pump - качать /насосом/
16. drilling fluid - (mud) - буровой раствор
17. inch - дюйм
18. hose - шланг, гибкая труба
19. top - верх
20. bottom - низ; bottom hole - забой
21. rotary table - ротор, стол ротора
22. to attach - присоединять
23. to hook - крюк
24. bail - серьга
25. to fit - устанавливать, монтировать
26. assembly - узел, агрегат, устройство

2) Read and translate the text.

3) Translate into Russian.

A device known as ... ; short piece of pipe called ... ; including the kelly and drill pipe, truly remarkable, under extreme pressure, at the bottom of the travelling block.

4) Road, translate and answer the question.

What is it?

1. A rotary tool that hang? From the rotary hook and travelling block. It also provides drilling fluid to flow into the drill stem. It is a ... .

2. Rotary machine used to turn the drill stem and support the drilling assembly. It is a ... .

3. All members in the assembly used for drilling by the rotary method from the swivel to the bit, including (включая)

- the kelly, drill pipe and tool joints. It is a … .

5) Answer the questions.

1. What does rotating equipment consists of?

2. What is a swivel? What are its main functions?

3. Psi - what does it express?

6) Say in English:

А. стол ротора, вертлюг, штанга, шланг, серьга, крюк, квадрат, узел /устройство/, забой, буровой раствор, давление, фунт, дюйм.

Б. состоять, называть, включать, вращать, качать, позволять, обеспечивать, превышать, прикреплять, входить.

7) Read and translate without dictionary.

The kelly is a four or six sided length of pipe. It, like a swivel, is also a unit which drilling mud is pumped on its way, to the bottom. The reason the kelly is four or six-sided is because, it series as a way of transferring the rota­ting motion of the rotary table to the drill string. Sinсe the drill pipe is connected to the bottom of' the kelly the pipe rotates. The bit also rotates because it is attached to the drill string. Most kellys are about 12 metres long.

Задание № 3

Сinoculating Equipment

1. Words to remember:

1. mud pump – грязевой насос

2. mud pits – приемные чаны, амбары для хранения бурового раствора

3. discharge line – выкидная линия, напорный трубопровод

4. standpipe – стояк, вертикальная труба

5. kelly hose - гибкий шланг

6. a swivel - вертлюг

7. drill collar – утяжеленная бурильная труба

8. annulus - затрубное пространство

9. shale shaker – вибрационное сито

2) Words to revise:

1. equipment

2. consist of

3. mud

4. flexible

5. wall

6. drill string

7. return

8. vibrate

9. device

10. reinforce

11. derrick

3) Read and translate the text.

Circulating equipment.

The equipment in circulating system consists ofa large number of items. The mud pump takes in mud from the mud pits and sends it out a discharge line to a standpipe. The standpipe is a steel pipe mounted vertically on one leg of the mast of the derrick.

The mud is pumped up the standpipe and into a flexible, very strong, reinforced rubber hose called rotary hose, or kelly hose. The rotary hose is connected to the swivel. The mud enters the swivel, goes down

the kelly, drill pipe and drill collars; and exits at the bit. It then does a sharp V-turn and heads back up the hole in the annulus. The annulus is the space between the outside of the drill string and wall of the hole.

Finally, the mud leaven the hole through a steel pipe called a mud return line and falls over a vibrating- device called the shale shaker. The circulating system is a closed system. The mud is circulated through the drilling of the well.

4) Make up sentences of the following words.

To consist of, to take in, to send out, to mount on, to pump up, to go down.

5) Translate into English.

Оборудование, состоять, грязевой насос, вертикальная труба, буровая вышка, гибкий, вертлюг, затрубное пространство, острый, внешний, падать, устройство.

6) Answer the questions.

1. What does the equipment in circulating system consist of?

2. Where does the mud pump take in mud from?

3. What is a standpipe?

4. Is the rotary hose connected to the swivel?

5. Describe, please, the moving of the mud,

6. Where is the end of the mud's travelling?

7. The circulating system is a closed one, isn't it?

7) Explain, please, in English the functions of the following things:

1. a mud pump

2. a standpipe

3. a derrick

4. a rotary hose

5. a drill string

6. a shale shaker

8) Say, please, a few words about circulating equipment.

Задание № 4

Hoisting System

1. Words to remember:
2. a rig – буровая установка
3. a hoisting system – система подъема инструмента
4. a drawwork – лебедка
5. a dеrriсk – буровая вышка
6. a crownbloск – кронблок
7. a travelling block – талевый блок
8. a drum – барабан
9. machinery – машинное оборудование
10. a catshaft - катушечный или промежуточный вал
11. a cathead - безопасная катушка, шпилевая катушка, катушка для затягивания инструментов и труб в вышку
12. to mount – устанавливать
13. a clutch - муфта сцепления, фрикционная муфта
14. chain-and-gear drive - цепная передача
15. to withstand - выдерживать

2) Words to revise:

1. a mast, a system, a piece, speed, change, brake, a rope, capacity, a load;

2. to have, to make, to consist, to contain, to stop, to prevent, to carry, to vary;

3.mechanical, diesel, heavy, main, strong, possible, vertical

4.regardless, basically, sometimes, as, usually, also.

3) Read and translate the text.

Hoisting System.

Regardless of whether rig is mechanical or diesel-electric, it must have a hoisting system. Basically, the hoisting system is made up of the drawworks (sometimes called the hoist), a mast or a derrick, the crown block, the travelling block and wire rope.

The draw works is a big, heavy piece of machinery. It consists of a revolving drum. It also has a cat shaft on which the catheads are mounted\* It also has several shafts, clutches, and chain-and-gear drives for speed and direction changes. It also contains a main brake, which can stop and prevent the drum from turning.

A drilling line is made up of wire rope from 28 to 38 millimetres diametre, as can be imagined, masts arid derricks have to be as strong as possible .

Manufacturers of derricks and masts usually rate their products in terms of vertical load they can carry and windload they can withstand from the side. Derricks or mast capacities for vertical loads vary from 100 up to 700 tonnes and can withstand a wind load of 160 to 210 kilometres per hour.

4) Translate the following sentences and explain the difference in translation the verbs:

1. It must have a hoisting system.

2. It also has a catshaft.

3. Derricks have to be as strong as possible.

5) Translate the words with -ing and say what it is:

1. It consists of a revolving drum.

2. It also contains a main brake, which can stop and prevent the

drum from turning.

3. A drilling line is made of wire rope.

6) Answer the questions.

1. What is the hoisting system made up of?

2. The drawworks is a big, heavy piece of machinery, isn't it?

3. What components does it consist of?

4. Is a drilling line made of wire rope?

5. What can you say about masts and derricks?

6. In what terms do manufacturers rate their products?

7. The loads can vary greatly, can't they?

Задание № 5

Bits

1. Remember:
2. to bore – бурить
3. to permit – позволять
4. passage – проход, прохождение
5. to join – соединять
6. bottom end – нижний конец
7. to attach – присоединять
8. roller-cone bit –шарошечное долото
9. to manufacture – производить
10. to insert – вставлять
11. jet bit – гидромониторное долото
12. to sweep (swept, swept) – поглощать
13. instead – наоборот, напротив
14. to embed – помешать
15. formation - пласт
16. to improve – улучшать
17. nozzle – насадка
18. diamond bit – алмазное долото

2) Read the words and translate them into Russian.

To circulate, bit, end, fluid, colomn, to cut, hard, rock, formation, cuttings, to use, to utilize, to consist of.

3) Say in English.

Долото, алмазное долото, шарошечное долото, гидромониторное долото, состоять, присоединять, улучшать, позволять, насадка, поток, проход жидкости, твердый пласт, мягкий пласт.

4) Read and translate the text.

Bits.

A bit is a cutting or boring element used in drilling oil and gas wells. The bit consists of the cutting element and the circulating element. The circulating element permits the passage of drilling fluid and utilizes the hydraulic force of the fluid stream to improve drilling rates. In rotary drilling several drill collars are joined to the bottom end of the drill-pipe colomn. The bit is attached to the end of the drill collar. Most bits used in rotary drilling are roller-cone bits. Most roller-cone bits have three cones although some have two and some have four.

Bit manufacturers either cut teeth out of the cones or in­sert very hard tungsten carbide buttons into the cones.

Jet bits have nozzles that direct a high-velocity stream or jet of drilling fluid to the sides and bottom of each cone, so that rock cuttings are, swept out of the way as bit drills.

Diamond bits do not have cones; nor do they have teeth. Instead, several diamonds are embedded into the bottom and sides of the bit.

Since diamonds are so hard, diamond bits are sometimes used to efficiently drill rock formations that are quite hard. They are also used to drill soft formations effectively.

5) Find the equivalents in the text.

Инструмент, используемый в . . . ,скорость бурения, несколько утяжеляющих буровых труб, конец ЦБТ, хотя, изготовители долот, вырезать из . . .или вставлять, большинство шарошечных долот . . . , которые направляют струю большой скорости; по мере движения долота; шлам, напротив, долота; чтобы успешно бурить твердую породу.

6) Read the text once more and answer the questions.

1. What is a bit?

2. What is it used for?

3. What elements does it consist of?

4. The circulating element permits the passage of drilling fluid, doesn’t it?

5. What is hydraulic force used for?

6. Is the bit attached to the upper part or the end of the drill collar?

7. What bits are used in rotary drilling?

8. How many cones have most roller- cone bits?

9. Do diamond bits have any cones?

10 Do they have any teeth?

11. What are the advantages of diamond bits?

7) Ask your groupmates.

1. Что ты знаешь о долоте?

2. Какие долота попользуются в роторном бурении?

3. Есть ли шарошки или зубья в алмазных долотах?

4. Что ты знаешь о работе гидромониторных долот?

5. Где наиболее эффективно используются алмазные долота?

8) Make up sentences, using verbs in the Passive Voice.

1) to the end, the bit, to attach, of the drill collar;

2) to join, several drilling, of the drill pipe, colomn, drill collars;

3) to sweep, out of the way, rock cuttings, as, bit, drills;

4) to embed, diamonds, several, into, of the bit, the bottom, the sides;

Задание № 6

Power System.

1. Words to remember:

1. engine – двигатель

2. power – энергия

3. internal combustion engine - двигатель внутреннего сгорания

4. to be similar to – быть похожим

5. gasoline – бензин

6. to furnish - -получить, образовать, создать

7. liquified gas – сжиженный газ

8. thus – таким образом

9. crew - бригада

2) Translate the following groups of words:

Power – powerful - powerless;

nature – natural – naturally;

to drive - driver;

to locate - location;

to equip - equipment;

advantage - disadvantage;

to reduce - reduction;

to generate - generator

liquid - liquified.

3)Find the synanyms.

To be similar to, to furnish, to involve, big, to drill, to be like, to include, common, large, to bore, well known, to produce.

4) Read and translate the text.

Power System.

Practically every rig uses internal combustion engines as its prime power source or its prime mover. A rig’s engine similar to the one in a car except that rig engines are bigger, more powerful, and do not use gasoline as a fuel.

Also rigs require more than one engine to furnish the needed power. Most rig engines today are diesels, although some are still around that burn natural or liquified gas as a fuel.

A rig, depending on its size and how deeps hole it must drill may have from 2 to 4 engines. Naturally, the bigger the rig, the deeper it can drill and the more power it will need. Thus, the big rigs have three or four engines, all of them to­gether developing up to 2200 or more kilowatts. Two common methods, are used to transfer the power: electrical and mechanical.

Upuntill a few years ago, most rigs were mechanical. Nowa­days diesel- electric rigs dominate, but there are many mechanical rigs are still around.

Diesel-electric power is the dominant method used to drive most of today’s rigs.

Diesel engines are usually located at ground level some dis­tance away from the rig floor, drive large electric generators. The generators produce electricity that is sent through cables to the equipment involved - drawworks, mud pumps and the rotary.

The diesel-electric system has a number of advantages over mechanical system. One of them is that the engines can be placed well away from the rig floor so that engine noise for the crew is reduced.

5) Find the equivalents in the text.

Ряд преимуществ; передается по проводам; оборудование, включающее; на расстоянии от . . . ; площадка; в зависимости от размера; естественно; чем больше установка, тем больше она требует энергии; двигатель внутреннего сгорания.

6) Answer the questions.

1. What kind of engine does every rig use?

2. How many engines may a rig have?

3. How much energy do they produce?

4. What are the two main methods used to transfer power?

5. Where are they located?

6. What is the main advantage of a diesel-electric system?

7. Is it important for the crew?

7) Translate into English.

1. На каждой буровой установке есть двигатель внутреннего сгорания.

2. Бензин в них в качестве топлива не используется.

3. Двигателей может быть несколько.

4. Есть двигатели, где используют природный или сжиженный газ в качестве топлива.

5. Чем больше установка, тем больше она потребляет энергии и глубже бурить.

6. Существует два способа передачи энергии: электрический и механический.

7. Наряду с дизель- электрическими установками существуют и механические.

8.Генераторы дают электричество, которое по проводам поступает на оборудование /лебедки, насосы и ротор.

Задание № 7

Derrick.

1. Words to remember:
2. a derrick – буровая вышка
3. boiler - котел
4. machinery – машинное оборудование
5. accessory – вспомогательный инструмент
6. hoist - поднимать
7. to shelter - укрывать
8. to employ - применять
9. to deal with – иметь дело
10. pulley – блок
11. Read and translate the text.

Derrick.

The drilling equipment consists essentially of a derrick, boiler, engine and power plant, and the necessary actuating machinery, tools and accessories.

The derrick is the tall, towerlike skeleton structure commonly found in every oil-field. Its principal purposes are to support the drilling equipment, suspend, hoist and lower the drilling and other tools and accessories, and to shelter the workers.

Thesе derricks vary in size according to the system of drilling employed, the geological conditions to be dealt with and the size depth of the well to be drilled.

Thе standard derrick most commonly used has been 84 feet high, while other heights range from 64-180 feet; the highest and heaviest derricks being used in connection with rotary drilling. This height, is determined from concrete foundation at the base of the derrick up to the crown block carrying the heavy crown pulley at the top of the derrick.

Within recent years, steel derricks have come into general use in the oil fields, especially in connection with the rotary drilling of very deep wells which require heavy derricks and equipment. In many fields, the steel derrick has actually displaced the wooden one.

3)Translate the following words:

( essentially, commonly, especially, actually) and try to use them in the sentences.

4) Determine, please, the functions of the following words:

1. The derrick is the ... structure ... found in every oil­field.

2. The derricks vary in size according to the system of drilling

employed …

3. The height isdetermined from concrete foundation ... to the crown block ...

4. ... steel derricks have come into general use ...

5. ... the steel derrick has ... displaced the wooden one.

5) Answer the questions:

1. What does the drilling equipment consist of?

2. What is a derrick?

3.Does rotary drilling need the highest and heaviest derricks?

4. How is the height of a derrick determined?

5. What kind of derricks are need nowadays?

6. Do they use wooden derricks in rotary drilling?

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