


МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
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«КРЫМСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ ИМЕНИ В.И. ВЕРНАДСКОГО»
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УЧЕБНОЕ ПОСОБИЕ
СБОРНИК ТЕХНИЧЕСКИХ ТЕКСТОВ НА АНГЛИЙСКОМ
ЯЗЫКЕ С УПРАЖНЕНИЯМИ

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Учебное пособие предназначено для проведения практических занятий по дисциплине «Иностранный язык» (английский) для обучающихся специальности 08.02.08 Монтаж и эксплуатация оборудования и систем газоснабжения очной и заочной форм обучения в СПО. Текстовый материал заимствован из оригинальной британской и американской научно-технической литературы и расположен в определённой логической последовательности. Тематический отбор материала позволяет широко ознакомить обучающихся с терминологией данной специальности. Пособие состоит из 25 текстов с лексико-грамматическими заданиями.

Утверждено на заседании цикловой комиссии № 2 общеобразовательных социально-гуманитарных дисциплин

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Протокол № 10

Председатель ЦК  Л.А. Сатарина

Вступление

Сборник технических текстов (для специальности 08.02.08 Монтаж и эксплуатация оборудования и систем газоснабжения является учебным пособием по английскому языку для обучающихся СПО и составлено в соответствии с требованиями программы по дисциплине ОГСЭ.03. Иностранный язык. Цель пособия подготовить обучающихся к чтению и переводу со словарем с английского языка на русский оригинальной литературы средней трудности по специальности.

В текстах содержится лексика и грамматические структуры, характерные для языка технической литературы. Разнообразие тематики дает возможность осуществления межпредметных связей. К текстам даются упражнения, цель которых закрепление лексического и грамматического материала. Система лексических упражнений предусматривает: 1) перевод текстов со словарем с английского языка на русский; 2) нахождение в тексте ответов на вопросы; 3) сопоставление английских эквивалентов с русскими, перевод словосочетаний; 4) перевод отдельных предложений с русского на английский; 5) поэтапное составление глоссария терминов: соединение терминов с их понятиями.

Все перечисленные задания, выполнение которых предусмотрено в период чтения самого текста, имеют целью не только усвоение лексики по специальности и грамматики, но и формирование умений иноязычной коммуникации. Именно поэтому ко всем текстам даны задания по развитию навыка общения в диалогической и монологической форме.

Особое внимание сконцентрировано на лексике профессиональной направленности, которая рассматривается в определенном контексте. В связи с этим предусматривается составления глоссария терминов по специальности.

TEXT 1. NATURAL GAS

Gas is more difficult to store than oil mainly because its volume at normal temperature and pressure is 1,000 times that of oil for the same amount of energy content. In small densely populated countries like the United Kingdom, when coal was the main source of fuel in the early twentieth century, an infrastructure was built to distribute gas from coal throughout the country using a pipeline system from the gas plants to homes in major towns and cities.

When North Sea gas was discovered, the system was modified and a pipeline system was created from the onshore terminals to domestic consumers. The system stores gas by increasing the pressure in the main pipeline. Storage is also created by pumping gas back into depleted oil and gas reservoirs. As North Sea reserves of oil and gas decline and gas is imported to the UK, storage is becoming more important. Where pipeline systems are not available, gas is distributed for domestic use in pressurized containers as propane or butane, known as liquefied petroleum gas (LPG). The liquefied gas is stored in cylindrical or spherical containers at refineries and terminals and can be transported by road to residential storage tanks or in smaller exchangeable cylinders. All storage must take into account dangers of overheating in accidental fires which can cause containers to explode. By cooling petroleum gas to -162 °C, it condenses to a liquid and 1/600th of its volume. This is called liquefied natural gas (LNG). The method is used for bulk transport of gas and is carried out at plants usually close to the source of the gas. LNG can be transported over long distances by special tankers by road or sea. It is stored at the LNG plant and at its destination in special insulated storage tanks. Russia has the largest reserves of natural gas in the world and transports most of its gas by pipeline.

1. Where is the liquefied gas stored?
2. How liquefied natural gas can be transported over long distances?
3. What country has the largest reserves of natural gas in the world?

2. Give English equivalents to the Russian words and word combinations:

Хранить; объем; основной источник топлива; увеличить давление в основном трубопроводе; герметичный контейнер; сжатый газ; запасы природного газа; танкер.

3. Translate the following sentences into English:

1. Для хранения газ закачивают в пустые газовые резервуары.
2. Сжатый природный газ может транспортироваться на большие расстояния специальными танкерами по суше или по морю.

4. Match the words (A) with the appropriate definition (B)

A	B
natural gas	1) material that is used for producing heat
fuel	2) a line of connected pipes for carrying oil or gas a long distance;
to store	3) a space measured by the length, by the width and by the depth;
pipeline	4) to make and keep a supply of something for future use;
volume	5) a type of substance like air and usually can not be seen.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the natural gas storage. Your talk should last a minute.

TEXT 2. OIL AND GAS TODAY

The oil and gas industry employs hundreds of thousands of people worldwide. Many teams have a mixture of nationalities so that English is often the language used, and is often specified for formal communications. Although most of the world has adopted an international measuring system and measures volume in litres, the oil industry often uses the US barrel as a measure even though most oil today is never contained in a barrel.

The sector of the oil and gas industry from discovery and drilling to production and refining is known as the upstream sector. Initially, producing countries allowed trading countries (USA, Britain, and Holland) to exploit their oil as a raw material. But they needed to control their own resources commercially and they realized the advantages of processing their crude oil locally to increase the value of the product. They built their own refineries where the crude oil is separated into different forms and converted into different products. The production of oil and gas has become a major element in international relations and politics. A large part of the industry has developed, transporting oil and gas from the producing countries to consumers and this is sometimes referred to as the midstream sector.

The processing of oil into different products is known as the downstream sector. The products include the different fuels required for cars, trucks, and airplanes, fuel for power stations and heating, the basic material or feedstock for plastics, fertilizers, pharmaceutical, and the asphalt that covers our roads. Oil and gas are finite resources and because of the increasing scarcity of oil and gas, concern for the environment, and concerns over security of supply, a huge effort is being made to develop alternative sustainable sources of energy, but the skills of the people working in the oil and gas industry across the world will ensure that oil and gas will be available to us for many years to come.

1. What measuring system is used in the oil and gas industry?
2. What do “upstream sector”, “midstream sector” and “downstream sector” mean?
3. Is the oil and gas industry environment friendly?

2. Give English equivalents to the Russian words and word combinations:

Нефтегазовая промышленность; очистительные сооружения для нефти; безопасность поставки нефти и газа; международная измерительная система; сырая нефть; переработка; топливо для электростанций и отопительных систем.

3. Translate the following sentences into English:

1. Транспортировка нефти и газа от стран производителей к потребителю является важной составляющей нефтегазовой промышленности.
2. Умения людей работающих в нефтегазовой промышленности обеспечивают безопасность поставок продукта.

4. Match the words (A) with the appropriate definition (B)

A	B
supply	1) a type of substance like air and usually can not be seen.
stream	2) to break or divide up into the parts;;
to separate	3); to make pure;
to refine	4) something flowing or moving forwards continuously;
gas	5) to provide something that is needed.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a plan to the text. Say some words about the oil and gas industry.

TEXT 3.SAFETY FIRST

The main causes of accidents in the workplace are not dramatic fires and explosions, but very ordinary accidents that can be easily prevented by workers looking out for their own safety and the safety of others. Many of these accidents are minor, but some cause death or serious injury. The most common cause of accidents is from slips, trips, and falls, followed by lifting and carrying.

Accidents involving cuts, burns, dropped objects, falling from height, and collisions are also common but often avoidable. The main preventable measure is safety training. All employees in the oil and gas industry go through regular safety training courses to encourage a strong safety culture. For hazardous areas, employees will be issued with Personal Protective Equipment (PPE) which must be worn in signed areas. Safety boots, hard hats, overalls, gloves, and safety glasses are usually a standard issue. In addition, ear protectors and special trades' equipment such as welding shields, goggles, and gloves will be issued. Safety signage has to be followed.

Signs are classified with different shapes and colours to denote whether they are mandatory, warnings, or giving information. Most signs are independent of language and use standard symbols as ideograms. The meaning of some of these signs is not always immediately obvious and so they should be learnt. Following information signs is practised in fire drills where workers must follow signs to safe areas. Those working offshore will attend special courses on helicopter escape, use of life jackets and survival craft, and escape through smoke.

There are often opportunities for workers to volunteer as fire officers or first aiders, and special training is given. Safety cultures are different in every country and those workers from countries with a high safety culture may not be sure how to act when they see unsafe conditions or acts where the safety culture is lower. A good guide is never to intervene unless there is imminent danger, but always to report to your supervisor or to an agreed point of contact. When workers are assigned particular tasks, it is good practice for supervisors to give toolbox talks. These are talks at the working area usually at the beginning of a shift. Supervisors have the opportunity to point out particular hazards and remind workers of current safety initiatives. Most tasks will require the supervisor to carry out a generic or a specific risk assessment for a task. If special hazards are involved, a task may require a Permit to Work, where special procedures may need to be followed. A permit would be required where there is the risk of exposure to petroleum vapour and a source of ignition such as a welding operation.

1. What are the most common accidents in the workplace?
2. Who goes through regular safety training courses and why?
3. How are safety signage classified?

2. Give English equivalents to the Russian words and word combinations:

Авария; взрыв; опасные зоны; спасательный жилет; безопасность; первая помощь; источник воспламенения; серьезные травмы; каска; допуск к работе; предупреждающие знаки; коробка с инструментами.

3.Translate the following sentences into English:

1. Необходимо получить допуск к работе специалистам газовой промышленности.
2. Безопасная обувь, каски, комбинезоны, перчатки и защитные очки являются стандартным набором по технике безопасности.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a plan to the text. Give a summary of the text in 150 words.

TEXT 4. BOILER

1. Read the text carefully and answer the following questions:

Boiler is a closed vessel in which water or other fluid is heated. The heated or vaporized fluid exits the boiler for use in various processes or heating applications, including boiler-based power generation, cooking and sanitation.

The source of heat for a boiler is combustion of any of several fuels, such as wood, coal, oil, or natural gas. Electric steam boilers use resistance- or immersion-type heating elements.

Hydronic boilers are used in generating heat for residential and industrial purposes. They are the typical power plant for central heating systems fitted to houses in northern Europe (where they are commonly combined with domestic water heating). The hydronic boiler operates by way of heating water/fluid to a preset temperature (or sometimes in the case of single pipe system until it boils and turns to steam) and circulating that fluid throughout the home typically by way of radiators baseboard heaters or through the floors. The fluid can be heated by any means...gas, wood, fuel oil, etc., but in built-up areas where piped gas is available, natural gas is currently the most economical and therefore the usual choice. The fluid is in an enclosed system and circulated throughout by means of a pump. The name "boiler" can be a misnomer in that, except for systems using steam radiators, the water in a properly functioning hydronic boiler never actually boils.

1. What fuel can be used for boiler?
2. What boiler is typically for central heating system?
3. What is the most economical type of fuel?

2. Give English equivalents to the Russian words and word combinations:

Нагревать; для использования; центральная отопительная система; жидкость испаряется; паровые батареи; с помощью насоса; кипеть; пар; труба; бойлер работает.

3. Translate the following sentences into English:

1. Водяной котел используется для производства тепла в жилых и промышленных зданиях.
2. Жидкость нагревают и она циркулирует в системе с помощью насоса.

4. Match the words (A) with the appropriate definition (B)

A	B
steam	1) a machine for forcing liquids, air, gas into or out;
to heat	2) water in a state of a gas produced by boiling;
boiler	3) a tube used for carrying liquids or gas;
pump	4) a closed vessel in which water or other fluid is heated;
pipe	5) to make warm or hot.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the hydronic boilers. It should last for about a minute and include 10 phrases.

TEXT 5. WHAT IS A HIGH EFFICIENCY CONDENSING BOILER?

1. Read the text carefully and answer the following questions:

Condensing boilers get their name because they condense periodically. In other words, they extract heat from the exhaust gases that would otherwise escape through the flue - turning water vapour from the gas back into liquid water or condensate.

A condensing boiler captures much more usable heat from its fuel than a non-condensing boiler. Its high operating efficiency is made possible by the design of the condensing boiler's larger – or sometimes dual - heat exchanger.

The heat exchanger makes sure that as much heat as possible is transferred from the boiler's burner - and as little as possible lost in gases through the flue.

There are two types of condensing boiler: regular and combination.

Regular condensing boilers heat your hot water through a hot water cylinder.

Combination condensing boilers give you instant hot water without the need for a cylinder.

1. What is condensing boiler?
2. What is heat exchanger in condensing boilers used for?
3. What types of condensing boilers are there?

2. Give English equivalents to the Russian words and word combinations:

Выхлопные газы; водяной пар; жидкость; забирать тепло от топлива; эффективность работы бойлера; горелка бойлера; теплообменник; потеря газа; нагревать горячую воду.

3. Translate the following sentences into English:

1. Высокая эффективность работы бойлера возможна благодаря теплообмена.
2. Комбинированный конденсационный бойлер оказывает постоянную горячую воду без использования цилиндра.

4. Match the words (A) with the appropriate definition (B)

A	B
vapour	1) to give and receive in return;
to heat	2) a gaslike form of a liquid, such as mist or steam;
boiler	3) material that is used for producing heat;
to exchange	4) a closed vessel in which water or other fluid is heated;
fuel	5) to make warm or hot.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the condensing boilers. It should last for about a minute and include 10 phrases.

TEXT 6. STEAM BOILERS

1. Read the text carefully and answer the following questions:

Steam water-tube cylindrical vertical boilers of series M3K are intended for generating saturated steam with temperature 175°C and absolute pressure 0.9 MPa, used for technological and heating needs. The boilers are delivered as single transportable units assembled with insulation and casing. They are of high degree of mounting readiness, minimum costs for starting-installation works, simple and convenient in exploitation. The delivery set of the boiler comprises a burner unit, a blower with electric drive, boiler fittings, a pump, a control devices, a ladder with a platform, etc.

The steam boilers of series M3K can be compared with similar types of boilers E 1-1000S(Japan) or NA-1-L (Finland) according to all indications. More than 7 thousand boilers series M3K made by TEKOM are operating in the CIS countries and in 6 far foreign countries.

At the request of the customers TEKOM performs mounting, starting and servicing of the steam boilers.

1. What are steam water-tube cylindrical vertical boilers of series M3K intended for?
2. What is the delivery set of the boiler?
3. What services can be performed by TEKOM?

2. Give English equivalents to the Russian words and word combinations:

Предназначен для изготовления насыщенного пара; абсолютное давление; оборудован изоляцией и обшивкой; комплект поставки; по требованию (желанию) потребителя; обслуживания парового бойлера, можно сравнить, монтаж.

3. Translate the following sentences into English:

1. Бойлер смонтирован как единое оборудование вместе с изоляцией и обшивкой.
2. Фирма осуществляет монтаж и обслуживание котлов.

4. Match the words (A) with the appropriate definition (B)

A	B
boiler	1) the action of putting force or weight onto something;
pressure	2) a machine for forcing liquids, or gas into or out;
to use	3) a container for boiling water;
to deliver	4) to employ for a purpose
pump	5) to take (goods, letters, etc.) to people's houses or places.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about steam boilers. Your talk should include 10 phrases.

TEXT 7. THE WATER TREATMENT UNITS AND THE SCALE SOLVENT

1. Read the text carefully and answer the following questions:

The water treatment units are intended for treatment water before feeding it to a steam boiler or for feeding hot-water boilers of the heating boiler rooms.

The water treatment units are completed with all necessary parts: a pump, fittings, instrumentation and are delivered in a form of maximum mounting readiness. WTU is intended for lighting and softening of water.

The scale solvent is used for preparation and refinement from mechanic admixtures of regeneration solution of the technical salt and is used in the system of softening the initial water together with sodium-cationite filters. It is a vertical cylindrical apparatus with the inner diameter 700 mm, installed on 3 supports.

The solution of the technical salt prepared in the scale solvent is used for regeneration (renewal) of ion exchanging capability of the cationite of water treatment units. The scale solvent is completed with pipes, fittings and instrumentation.

1. What is the water treatment unit intended for?
2. What is the water treatment unit completed with?
3. What is the scale solvent used for?

2. Give English equivalents to the Russian words and word combinations:

Устройство предназначено для обработки воды, котельные доставляют в максимальной монтажной готовности; очистки от механических примесей; система смягчения воды; солерастворитель укомплектован трубами и арматурой, восстановление, внутренний диаметр.

3. Translate the following sentences into English:

1. Солерастворитель предназначен для очистки от примесей раствора технической соли.
2. Устройство для обработки воды используется для смягчения воды перед подачей в паровой котел.

4. Match the words (A) with the appropriate definition (B)

A	B
solution	1) to employ for a purpose;
pipe	2) to take (goods, letters, etc.) to people's houses or places;
to use	3) to bear the weight;
to support	4) liquid containing a solid or gas mixed into it;
to deliver	5) a tube used for carrying liquids or gas.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the water treatment units. Your talk should include 10

TEXT 8. GAS METERS

1. Read the text carefully and answer the following questions:

A **gas meter** is used to measure the volume of fuel gases such as natural gas and propane. Gas meters are used at residential, commercial, and industrial buildings that consume fuel gas supplied by a gas utility. Gases are more difficult to measure than liquids, as measured volumes are highly affected by temperature and pressure. Gas meters measure a defined volume, regardless of the pressurized quantity or quality of the gas flowing through the meter. Temperature, pressure and heating value compensation must be made to measure actual amount and value of gas moving through a meter.

Several different designs of gas meters are in common use, depending on the volumetric flow rate of gas to be measured, the range of flows anticipated, the type of gas being measured and other factors. **Diaphragm/bellows meters.** These are the most common type of gas meter, seen in almost all residential and small commercial installations. Within the meter there are two or more chambers formed by movable diaphragms. With the gas flow directed by internal valves, the chambers alternately fill and expel gas, producing a near continuous flow through the meter. As the diaphragms expand and contract, levers connected to cranks convert the linear motion of the diaphragms into rotary motion of a crank shaft which serves as the primary flow element. This shaft can drive an odometer-like counter mechanism to measure the flow of gas.

1. What is a gas meter used for?
2. What is the most common type of gas meter?
3. What is the operation mode of a diaphragm meter?

2. Give English equivalents to the Russian words and word combinations:

Давление; мембранный газовый счетчик; измерять определенный объем природного газа; счетное устройство; поток газа, проходить через счетчик

3. Translate the following sentences into English:

1. Газовый счетчик измеряет объем использованного природного газа потребителем.
2. Мембранный счетчик – наиболее типичный газовый счетчик, предусмотренный для жилых помещений.

4. Match the words (A) with the appropriate definition (B)

A	B
motion	1) a type of substance like air and usually can not be seen;
pipe	2) to find the size, length, amount, degree (to show or record);
to measure	3) a tube used for carrying liquids or gas;
valve	4) the act, way or process of moving ;
gas	5) a door like part of a pipe which opens and shuts to control the flow of gas.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the most common type of gas meter. Your talk should include 10 phrases.

TEXT 9. PIPELINE TRANSPORT

1. Read the text carefully and answer the following questions:

Pipeline transport is the transportation of goods through a pipe. Most commonly, liquid and gases are sent, but pneumatic tubes that transport solid capsules using compressed air are also used.

As for gases and liquids, any chemically stable substance can be sent through a pipeline. Therefore sewage, slurry, water, or even beer pipelines exist; but arguably the most valuable are those transporting fuels: oil (oleoduct), natural gas (gas grid), and biofuels.

Dmitri Mendeleev first suggested using a pipe for transporting petroleum in 1863.

There is some argument as to when the first crude oil pipeline was built. However, some say pipeline transport was pioneered by Vladimir Shukhov and the Branobel company in the late 19th century. Others say oil pipelines originated when the Oil Transport Association first constructed a 2-inch (51 mm) wrought iron pipeline over a 6-mile (9.7 km) track from an oil field in Pennsylvania to a railroad station in Oil Creek, in the 1860s. Pipelines are generally the most economical way to transport large quantities of oil, refined oil products or natural gas over land. Compared to shipping by railroad, they have lower cost per unit and higher capacity. Although pipelines can be built under the sea, that process is economically and technically demanding, so the majority of oil at sea is transported by tanker ships.

1. What is pipeline transport?
2. What products can be sent through a pipeline?
3. Who suggested first a pipeline for transporting petroleum?

2. Give English equivalents to the Russian words and word combinations:

Товары; трубопровод; топливо; сжатый воздух; использовать; газ; жидкость; предлагать; нефть; нефтяное месторождение; большое количество; под водой; очищенный нефтепродукт; низкая стоимость; высокий объем.

3. Translate the following sentences into English:

1. Трубопроводы - наиболее эффективное средство транспортировки большого количества нефти и нефтепродуктов, природного газа.
2. Твердые продукты транспортируются с использованием сжатого воздуха.

4. Match the words (A) with the appropriate definition (B)

A	B
pipes	1) to force into less space; press together;
to compress	2) material that is used for producing heat
to construct	3) firm; something that does not flow ;
solid	4) to build; make by putting together;
fuel	5) tubes used for carrying liquids or gas.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the transportation of goods through a pipe. Your talk should last a minute.

TEXT 10. OIL PIPELINES

1. Read the text carefully and answer the following questions:

Pipelines are generally the most economical way to transport large quantities of oil, refined oil products or natural gas over land. Compared to shipping by railroad, they have lower cost per unit and higher capacity. Although pipelines can be built under the sea, that process is economically and technically demanding, so the majority of oil at sea is transported by tanker ships.

Oil pipelines are made from steel or plastic tubes with inner diameter typically from 4 to 48 inches (100 to 1,200 mm). Most pipelines are buried at a typical depth of about 3 to 6 feet (0.91 to 1.8 m). The oil is kept in motion by pump stations along the pipeline, and usually flows at speed of about 1 to 6 metres per second (3.3 to 20 ft/s). Multi-product pipelines are used to transport two or more different products in sequence in the same pipeline. Usually in multi-product pipelines there is no physical separation between the different products. Some mixing of adjacent products occurs, producing interface. At the receiving facilities this interface is usually absorbed in one of the product based on pre-calculated absorption rates.

1. What way is the most economically to transport large quantities of oil or natural gas?
2. What types of pipelines do you know?
3. What materials are oil pipelines made from?

2. Give English equivalents to the Russian words and word combinations:

Трубопровод; экономичное средство; очищенная нефть; природный газ; многофункциональный трубопровод; использовать; последовательность; распределение; смешивания продуктов; проникновение; оборудование на этапе получения продукта; предварительные расчеты; нормы абсорбции.

3. Translate the following sentences into English:

1. Большинство трубопроводов строятся на глубине от 0,91 до 1,8 метров.
2. Нефть движется по трубопроводу с помощью насосных станций.

4. Match the words (A) with the appropriate definition (B)

A	B
pipeline	1) thick fatty liquid used for burning, making machines run easy;
oil	2) a line of connected pipes for carrying oil or gas a long distance;
pump	3) being apart;
separation	4) changing place or position;
motion	5) a machine for forcing liquids, air, gas into or out of something.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the types of pipelines. Your talk should last a minute.

TEXT 11. A "PIG" LAUNCHER/RECEIVER

1. Read the text carefully and answer the following questions:

Multi-product pipelines are used to transport two or more different products in sequence in the same pipeline. Usually in multi-product pipelines there is no physical separation between the different products. Some mixing of adjacent products occurs, producing interface. At the receiving facilities this interface is usually absorbed in one of the product based on pre-calculated absorption rates.

Crude oil contains varying amounts of wax, or paraffin, and in colder climates wax buildup may occur within a pipeline. Often these pipelines are inspected and cleaned using pipeline inspection gauges, pigs, also known as scrapers or Go-devils.

Smart pigs (also known as intelligent or intelligence pigs) are used to detect anomalies in the pipe such as dents, metal loss caused by corrosion, cracking or other mechanical damage. These devices are launched from pig-launcher stations and travel through the pipeline to be received at any other station down-stream, either cleaning wax deposits and material that may have accumulated inside the line or inspecting and recording the condition of the line.

1. What are multi-product pipelines used for?
2. What does crude oil contain?
3. What is pig? What are pigs used for?

2. Give English equivalents to the Russian words and word combinations:

Сырая нефть; устройство для проверки трубопровода; использовать; потеря металла из-за коррозии; по течению; фиксация состояния трубопровода; трещина; уровень абсорбции; предварительные расчеты; вмятина.

3. Translate the following sentences into English:

1. Устройство проверяет и очищает трубопровод от воска и парафина, которые могут накапливаться в трубопроводе.
2. Умные приборы используются для обнаружения дефектов в трубопроводе, таких как вмятины, коррозию, трещины и другие повреждения.

4. Match the words (A) with the appropriate definition (B)

A	B
pipeline	1) a thin opening caused by breaking but not in separated parts;
wax	2) oxidation of metals in reaction with oxygen;
corrosion	3) a solid material made of fats or oils, melted by heat being;
crack	4) to clean; remove unwanted material from surface;
to scrape	5) a line of connected pipes for carrying oil or gas a long distance.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the smart devices in the pipeline. It should include 10 phrases.

TEXT12. TYPES OF PIPELINES BY TRANSPORT FUNCTION

1. Read the text carefully and answer the following questions:

For natural gas, pipelines are constructed of carbon steel and varying in size from 2 to 60 inches (51 to 1,500 mm) in diameter, depending on the type of pipeline. The gas is pressurized by compressor stations and is odorless unless mixed with a mercaptan odorant where required by a regulating authority.

In general, pipelines can be classified in three categories depending on purpose:

Gathering pipelines - group of smaller interconnected pipelines forming complex networks with the purpose of bringing crude oil or natural gas from several nearby wells to a treatment plant or processing facility. In this group, pipelines are usually short - a couple of hundred meters - and with small diameters. Also sub-sea pipelines for collecting product from deep water production platforms are considered gathering systems.

Transportation pipelines - mainly long pipes with large diameters, moving products (oil, gas, refined products) between cities, countries and even continents. These transportation networks include several compressor stations in gas lines or pump stations for crude and multiproducts pipelines.

Distribution pipelines - composed of several interconnected pipelines with small diameters, used to take the products to the final consumer. Feeder lines to distribute gas to homes and businesses downstream. Pipelines at terminals for distributing products to tanks and storage facilities are included in this group.

1. What three groups can be pipelines classified in?
2. What does transportation pipeline network include?
3. Do feeder lines distribute gas to homes and business downstream?

2. Give English equivalents to the Russian words and word combinations:

Соединенные между собой трубопроводы; комплекс сетей; газовые и нефтяные месторождения; сбор продукта; причины; движение продукта; насосные станции; состоять из нескольких трубопроводов; распределять; перерабатывающие заводы.

3. Translate the following sentences into English:

1. В трубопроводе используются компрессорные станции для транспортировки газа.
2. Для подачи газа к потребителю используют сеть распределительных газопроводов.

4. Match the words (A) with the appropriate definition (B)

A	B
pipeline	1) a part of machine for compressing air or gas;
gas	2) a line of connected pipes for carrying oil or gas a long distance;
pump	3) to give out among several people, places, etc.;
to distribute	4) a machine for forcing liquids, air, gas into or out of something;
compressor	5) a type of substance like air and usually cannot be seen.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the classification of pipelines depending on purpose. It should include 10 phrases.

TEXT 13. THE FIELD DEVICES ALONG THE PIPELINE

1. Read the text carefully and answer the following questions:

When a pipeline is built, the construction project not only covers the civil work to lay the pipeline and build the pump/compressor stations, it also has to cover all the work related to the installation of the field devices that will support remote operation.

Field devices are instrumentation, data gathering units and communication systems. The field Instrumentation includes flow, pressure and temperature gauges/transmitters, and other devices to measure the relevant data required. These instruments are installed along the pipeline on some specific locations, such as injection or delivery stations, pump stations (liquid pipelines) or compressor stations (gas pipelines), and block valve stations.

The information measured by these field instruments is then gathered in local Remote Terminal Units (RTU) that transfer the field data to a central location in real time using communication systems, such as satellite channels, microwave links, or cellular phone connections.

Pipelines are controlled and operated remotely, from what is usually known as The Main Control Room. In this center, all the data related to field measurement is consolidated in one central database. The data is received from multiple RTUs along the pipeline. It is common to find RTUs installed at every station along the pipeline.

1. What support remote operation devices are built along the pipelines?
2. What does field instrumentation include?
3. How are pipelines controlled and operated?

2. Give English equivalents to the Russian words and word combinations:

Трубопровод; установка прибора; телефонная связь; насосная станция; давление; комната дистанционного управления; поддерживающее дистанционное оборудования; измерять; записывать и передавать данные; в настоящее время; вдоль трубопровода.

3. Translate the following sentences into English:

1. Трубопровод контролируется и управляется на расстоянии.
2. Вдоль трубопровода строятся вспомогательные системы сбора и передачи информации.

4. Match the words (A) with the appropriate definition (B)

A	B
pressure	1) a part of machine for compressing air or gas;
remote	2) a line of connected pipes for carrying oil or gas along
compressor	3) to give out among several people, places, etc.;
to distribute	4) the action of putting force or weight onto something;
pipeline	5) distant in space or time.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
3. Say some words about the field devices installed along the pipeline. Your talk should last a minute.

TEXT 14. THE SCADA SYSTEM FOR PIPELINES

1. Read the text carefully and answer the following questions:

The SCADA system at the Main Control Room receives all the field data and presents it to the pipeline operator through a set of screens or Human Machine Interface, showing the operational conditions of the pipeline. The operator can monitor the hydraulic conditions of the line, as well as send operational commands (open/close valves, turn on/off compressors or pumps, change set points, etc.) through the SCADA system to the field.

To optimize and secure the operation of these assets, some pipeline companies are using what is called Advanced Pipeline Applications, which are software tools installed on top of the SCADA system, that provide extended functionality to perform leak detection, leak location, batch tracking (liquid lines), pig tracking, composition tracking, predictive modeling, look ahead modeling, operator training and more.

1. What is Scada system at the Main Control Room used for?
2. Who can monitor the hydraulic conditions of the line?
3. What provides to perform leak detection and leak location?

2. Give English equivalents to the Russian words and words combinations:

Главная комната управления; устанавливать; трубопровод; природный газ; место утечки; открывать вентиль; включить / выключить компрессор; экран; условия работы; обеспечивать функционирование.

3. Translate the following sentences into English:

1. Оператор осуществляет мониторинг гидравлических условий трубопровода, а также посылает операционные команды .
2. Информация об операционных условия трубопровода обеспечиваются системой Скада.

4. Match the words (A) with the appropriate definition (B)

A	B
pressure	1) a part of machine for compressing air or gas;
leak	2) a line of connected pipes for carrying oil or gas along
compressor	3) to find out; notice or discover;
to detect	4) the action of putting force or weight onto something;
pipeline	5) a small accidental hole or crack through which something flows in or out.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the SCADA system. Your talk should last a minute.

TEXT 15. THE MAIN ELEMENTS OF A PIPELINE SYSTEM

1. Read the text carefully and answer the following questions:

Pipeline networks are composed of several pieces of equipment that operate together to move products from location to location. The main elements of a pipeline system are: **Initial injection station.** Known also as supply or inlet station, is the beginning of the system, where the product is injected into the line. Storage facilities, pumps or compressors are usually located at these locations.

Compressor/pump stations. Pumps for liquid pipelines and Compressors for gas pipelines are located along the line to move the product through the pipeline. The location of these stations is defined by the topography of the terrain, the type of product being transported, or operational conditions of the network.

Partial delivery station. Known also as intermediate stations, these facilities allow the pipeline operator to deliver part of the product being transported.

Block valve station. These are the first line of protection for pipelines. With these valves the operator can isolate any segment of the line for maintenance work or isolate a rupture or leak. Block valve stations are usually located every 20 to 30 miles (48 km), depending on the type of pipeline. Even though it is not a design rule, it is a very usual practice in liquid pipelines. The location of these stations depends exclusively on the nature of the product being transported, the trajectory of the pipeline and/or the operational conditions of the line.

Regulator station. This is a special type of valve station, where the operator can release some of the pressure from the line. Regulators are usually located at the downhill side of a peak.

Final delivery station. Known also as outlet stations or terminals, this is where the product will be distributed to the consumer. It could be a tank terminal for liquid pipelines or a connection to a distribution network for gas pipelines.

1. What are pipeline networks composed of?
2. Where is the product injected into the pipeline?
3. What is the first line of protection for pipelines?

2. Give English equivalents to the Russian words and words combinations:

Компрессорная станция; оборудование; операционные условия; поставлять; природный газ; поставлять приборы; сеть трубопроводов; насосная станция; вход в трубопровод.

3. Translate the following sentences into English:

1. Компрессоры для трубопровода размещены вдоль трубопровода для продвижения продукта.
2. Промежуточные станции позволяют оператору поставлять лишь часть транспортируемого продукта.
3. С помощью защитного вентиля оператор может отключить любой отрезок трубопровода.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the main elements of a pipeline system. Your dialogue should include 10 phrases.

TEXT 16. LEAK DETECTION SYSTEMS

1. Read the text carefully and answer the following questions:

Since oil and gas pipelines are an important asset of the economic development of almost any country, it has been required either by government regulations or internal policies to ensure the safety of the assets, and the population and environment where these pipelines run.

Pipeline companies face government regulation, environmental constraints and social situations. Pipeline companies should comply with government regulations which may define minimum staff to run the operation, operator training requirements, up to specifics including pipeline facilities, technology and applications required to ensure operational safety. As an example, in the State of Washington, it is mandatory for pipeline operators to be able to detect and locate leaks of 8 percent of maximum flow within 15 minutes or less.

Different types of technologies and strategies have been implemented, from physically walking the lines to satellite surveillance. The most common technology to protect these lines from occasional leaks is known as Computational Pipeline Monitoring Systems or CPM. CPM takes information from the field related to pressures, flows, and temperatures to estimate the hydraulic behavior of the product being transported. Once the estimation is done, the results are compared to other field references to detect the presence of an anomaly or unexpected situation, which may be related to a leak.

2. Give English equivalents to the Russian words and word combinations:

Система нахождения утечки; безопасно; элементы трубопровода; защита трубопровода; непредсказуемая ситуация; середина трубопровода; стратегия была внедрена; с высоким уровнем ожидания; размещение трубопровода; работники трубопровода; выполнять операции.

3. Translate the following sentences into English:

1. Газопроводы - это важные имущественные активы экономического развития.
2. Операторы трубопровода могут определять и находить утечки газа.

4. Match the words (A) with the appropriate definition (B)

A	B
leak	1) to find out, notice or discover;
pump	2) a line of connected pipes for carrying oil or gas along;
to detect	3) the act of taking something to someone;
delivery	4) a machine for forcing liquids, air, gas into or out;
pipeline	5) a small accidental hole or crack through which something flows in or out.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Work in pairs. Discuss the problem of leak detection. Your dialogue should include 10 phrases.

TEXT 17. METERING STATIONS / VALVES

1. Read the text carefully and answer the following questions:

Metering Stations. In addition to compressing natural gas to reduce its volume and push it through the pipe, metering stations are placed periodically along interstate natural gas pipelines. These stations allow pipeline companies to monitor the natural gas in their pipes. Essentially, these metering stations measure the flow of gas along the pipeline, and allow pipeline companies to 'track' natural gas as it flows along the pipeline. These metering stations employ specialized meters to measure the natural gas as it flows through the pipeline, without impeding its movement.

Valves. Interstate pipelines include a great number of valves along their entire length. These valves work like gateways; they are usually open and allow natural gas to flow freely, or they can be used to stop gas flow along a certain section of pipe. There are many reasons why a pipeline may need to restrict gas flow in certain areas. For example, if a section of pipe requires replacement or maintenance, valves on either end of that section of pipe can be closed to allow engineers and work crews safe access. These large valves can be placed every 5 to 20 miles along the pipeline, and are subject to regulation by safety codes.

1. What allows pipeline companies to monitor the natural gases in their pipes?
2. What do valves work like?
3. How can a pipeline restrict gas flow?

2. Give English equivalents to the Russian words and word combinations:

Уменьшить объем; измерительные станции; поток газа; значительное количество вентилей; течь свободно; используют для остановки газа; труба нуждается в замене; ремонт.

3. Translate the following sentences into English:

1. Измерительные приборы измеряют поток газа не препятствуя его движению
2. Вентили могут перекрывать поток газа в пределах отдельного участка трубопровода.

4. Match the words (A) with the appropriate definition (B)

A	B
valve	1) a type of substance like air and usually can not be seen;
pipe	2)) a line of connected pipes for carrying oil or gas along;
to measure	3) a tube used for carrying liquids or gas;
pipeline	4) to find the size, length, amount, degree (to show or record);
gas	5) a doorlike part of a pipe which opens and shuts to control the flow of gas.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Say some words about the main elements of a pipeline system. Your talk should include 10 phrases.

TEXT 18. CORROSION

1. Read the text carefully and answer the following questions:

Corrosion is the disintegration of an engineered material into its constituent atoms due to chemical reactions with its surroundings. In the most common use of the word, this means electrochemical oxidation of metals in reaction with an oxidant such as oxygen. Formation of an oxide of iron due to oxidation of the iron atoms in solid solution is a well-known example of electrochemical corrosion, commonly known as rusting. This type of damage typically produces oxide(s) and/or salt(s) of the original metal. Corrosion can also refer to other materials than metals, such as ceramics or polymers, although in this context, the term degradation is more common.

In other words, corrosion is the wearing away of metals due to a chemical reaction. Many structural alloys corrode merely from exposure to moisture in the air, but the process can be strongly affected by exposure to certain substances. Corrosion can be concentrated locally to form a pit or crack, or it can extend across a wide area more or less uniformly corroding the surface. Because corrosion is a diffusion controlled process, it occurs on exposed surfaces. As a result, methods to reduce the activity of the exposed surface, such as passivation and chromate-conversion, can increase a material's corrosion resistance. However, some corrosion mechanisms are less visible and less predictable. Rust is the most familiar example of corrosion.

1. What does corrosion mean?
2. What methods are there to reduce corrosion?
3. Call the most familiar example of corrosion?

2. Give English equivalents to the Russian words and word combinations:

Окисления; железо; трещины; поверхность; уменьшить коррозию; повысить сопротивление металла; твердый раствор; влажность воздуха; из-за химической реакции; менее видимые; ржавчина

3. Translate the following sentences into English:

1. Ржавчина - это наиболее известный пример коррозии.
2. Коррозия приводит к трещинам.

4. Match the words (A) with the appropriate definition (B)

A	B
corrosion	1) to combine with oxygen, esp. to become rusty;
alloy	2) water or other liquids, in small quantities (steam or mist);
to oxidize	3) a very common and useful metal, used in making steel;
moisture	4) oxidation of metals in reaction with oxygen;
iron	5) a metal that consists of two or more different metals mixed together.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Work in pairs. Discuss the problem of corrosion in a pipeline. Your talk should last a minute.

TEXT 19. GALVANIC CORROSION

1. Read the text carefully and answer the following questions:

Galvanic corrosion occurs when two different metals electrically contact each other and are immersed in an electrolyte. In order for galvanic corrosion to occur, an electrically conductive path and an ionically conductive path are necessary. This effects a galvanic couple where the more active metal corrodes at an accelerated rate and the more noble metal corrodes at a retarded rate. When immersed, neither metal would normally corrode as quickly without the electrically conductive connection (usually via a wire or direct contact). Galvanic corrosion is often utilized in sacrificial anodes. What type of metal(s) to use is readily determined by following the galvanic series. For example, zinc is often used as a sacrificial anode for steel structures, such as pipelines or docked naval ships. Galvanic corrosion is of major interest to the marine industry and also anywhere water can contact pipes or metal structures.

Factors such as relative size of anode (smaller is generally less desirable), types of metal, and operating conditions (temperature, humidity, salinity, etc.) will affect galvanic corrosion. The surface area ratio of the anode and cathode will directly affect the corrosion rates of the materials.

1. When does galvanic corrosion occur?
2. What metal is often used as a sacrificial anode for steel structures?
3. What factors will affect the corrosion rates of the materials?

2. Give English equivalents to the Russian words and word combinations:

Коррозия появляется; углубляться; гальваническая пара; нормы задержки коррозии; ускоренные нормы; через провод; использовать; трубы; размер; уровень коррозии; условия эксплуатации.

3. Translate the following sentences into English:

1. Цинк часто используют как анод для стальных конструкций.
2. Влажность приводит к коррозии.

4. Match the word (A) with the appropriate definition (B)

A	B
humidity	1) tubes used for carrying liquids or gas;
pipes	2) a length of thin metal in the form of thread;
corrosion	3) the amount of water vapour contained in the air;
wire	4) the outer part of an object;
surface	5) oxidation of metals in reaction with oxygen.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. . Make up a dialogue about the galvanic corrosion. It should last for about a minute and include 10 phrases.

TEXT 20. RESISTANCE TO CORROSION

1. Read the text carefully and answer the following questions:

Some metals are more intrinsically resistant to corrosion than others, either due to the fundamental nature of the electrochemical processes involved or due to the details of how reaction products form. For some examples, see galvanic series. If a more susceptible material is used, many techniques can be applied during an item's manufacture and use to protect its materials from damage.

Gold nuggets do not naturally corrode, even on a geological time scale.

The materials most resistant to corrosion are those for which corrosion is thermodynamically unfavorable. Any corrosion products of gold or platinum tend to decompose spontaneously into pure metal, which is why these elements can be found in metallic form on Earth, and is a large part of their intrinsic value. More common "base" metals can only be protected by more temporary means.

Some metals have naturally slow reaction kinetics, even though their corrosion is thermodynamically favorable. These include such metals as zinc, magnesium, and cadmium. While corrosion of these metals is continuous and ongoing, it happens at an acceptably slow rate. An extreme example is graphite, which releases large amounts of energy upon oxidation, but has such slow kinetics that it is effectively immune to electrochemical corrosion under normal conditions.

1. Why are some metals more intrinsically resistant to corrosion than others?
2. Do gold nuggets naturally corrode?
3. How can the materials be protected from damage?

2. Give English equivalents to the Russian words and word combinations:

Защищать от повреждения; внутреннее сопротивление; медленная реакция; окисления; сопротивление коррозии; производство товаров; можно применять; чистый металл; выделять энергию; обычные условия.

3. Translate the following sentences into English:

1. Некоторые металлы имеют большее естественное сопротивление к коррозии.
2. Применяются различные средства для защиты металлов от повреждений.

4. Match the words (A) with the appropriate definition (B)

A	B
resistant	1) a valuable soft yellow metal;
damage	2) remain unchanged or unharmed ;
corrosion	3) the process of spoiling the quality of something;
gold	4) not mixed with anything else;
pure	5) oxidation of metals in reaction with oxygen.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Give a summary to the text in 50-70 words/.

TEXT 21. PASSIVATION**1. Read the text carefully and answer the following questions:**

Given the right conditions, a thin film of corrosion products can form on a metal's surface spontaneously, acting as a barrier to further oxidation. When this layer stops growing at less than a micrometre thick under the conditions that a material will be used in, the phenomenon is known as passivation (rust, for example, usually grows to be much thicker, and so is not considered passivation, because this mixed oxidized layer is not protective). While this effect is in some sense a property of the material, it serves as an indirect kinetic barrier: the reaction is often quite rapid unless and until an impermeable layer forms. Passivation in air and water at moderate pH is seen in such materials as aluminium, stainless steel, titanium, and silicon.

These conditions required for passivation are specific to the material. The effect of pH is recorded using Pourbaix diagrams, but many other factors are influential. Some conditions that inhibit passivation include: high pH for aluminium, low pH or the presence of chloride ions for stainless steel, high temperature for titanium (in which case the oxide dissolves into the metal, rather than the electrolyte) and fluoride ions for silicon. On the other hand, sometimes unusual conditions can bring on passivation in materials that are normally unprotected, as the alkaline environment of concrete does for steel rebar.

1. What phenomenon is known as passivation?
2. What serves as an indirect kinetic barrier for materials?
3. What conditions inhibit passivation in materials?

2. Give English equivalents to the Russian words and word combinations:

Тонкая пленка; барьер к окислению; в условиях; непроницаемый слой (пленка); нержавеющая сталь; окружающая среда; окиси; стальная арматура; необычные условия; окиси переходят в металлы.

3. Translate the following sentences into English:

1. Реакция проходит часто очень быстро.
2. Условия, необходимые для прохождения процесса пассивации, особые для различных материалов.

4. Match the words (A) with the appropriate definition (B)

A	B
rust	1) a thickness of some substance, often one of many;
layer	2) the reddish brown surface that forms on iron by water and air;
corrosion	3) a chemical compound: something is combined with oxygen;
oxide	4) a silver-white metal, light in weight and easily shaped;
aluminium	5) oxidation of metals in reaction with oxygen.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. . Prepare reports about corrosion. A report should include 2000-3000 words.

TEXT 22. PIPELINE INSPECTION AND SAFETY

1. Read the text carefully and answer the following questions:

In order to ensure the efficient and safe operation of the extensive network of natural gas pipelines, pipeline companies routinely inspect their pipelines for corrosion and defects. This is done through the use of sophisticated pieces of equipment known as 'smart pigs.' Smart pigs are intelligent robotic devices that are propelled down pipelines to evaluate the interior of the pipe. Smart pigs can test pipe thickness, and roundness, check for signs of corrosion, detect minute leaks, and any other defect along the interior of the pipeline that may either impede the flow of gas, or pose a potential safety risk to the operation of the pipeline. Sending a smart pig down a pipeline is fittingly known as 'pigging' the pipeline.

In addition to inspection with smart pigs, there are a number of safety precautions and procedures in place to minimize the risk of accidents. In fact, the transportation of natural gas is one of the safest ways of transporting energy, mostly due to the fact that the infrastructure is fixed, and buried underground.

1. How do pipeline companies inspect their pipelines for corrosion and defects?
2. What are smart pigs used for?
3. Why is the transportation of natural gas one of the safest ways?

2. Give English equivalents to the Russian words and word combinations:

Гарантировать безопасную работу трубопровода; использование оборудования; прибор-робот; тестировать; препятствовать потоку газа; оценивать трубопровод внутри; толщина трубы; признаки коррозии; находить утечки газа.

3. Translate the following sentences into English:

1. Одним из наиболее безопасных путей транспортировки природного газа - это трубопровод.
2. Устройство, что инспектирует трубы изнутри, называется PIG.

4. Match the words (A) with the appropriate definition (B)

A	B
pipe	1) oxidation of metals in reaction with oxygen;
corrosion	2)) a line of connected pipes for carrying oil or gas along;
leak	3) a tube used for carrying liquids or gas;
pipeline	4) to find out, notice or discover;
to detect	5) a small accidental hole or crack through which something flows in or out .

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Discuss the possibility of efficient and safe operation of the natural gas pipelines.

TEXT 23. PIPELINE CONSTRUCTION

1. Read the text carefully and answer the following questions:

As natural gas use increases, so does the need to have transportation infrastructure in place to supply the increased demand. Building pipelines allows transportation of natural gas to those areas that are underserved. Installing a pipeline is much like an assembly line process, with sections of the pipeline being completed in stages. First, the path of the pipeline is cleared of all removable impediments, including trees, boulders, brush, and anything else that may prohibit the construction.

Once the pipeline's path has been cleared sufficiently to allow construction equipment to gain access, sections of pipes are laid out along the intended path, a process called 'stringing' the pipe. These pipe sections are commonly from 40 to 80 feet long, and are specific to their destination. That is, certain areas have different requirements for coating material and pipe thickness. Once the pipe is in place, trenches are dug alongside the laid out pipe. These trenches are typically five to six feet deep, as the regulations require the pipe to be at least 30 inches below the surface. In certain areas, however, including road crossings and bodies of water, the pipe is buried even deeper. Once the trenches are dug, the pipe is assembled and contoured. This includes welding the sections of pipe together into one continuous pipeline, and bending it slightly, if needed, to fit the contour of the pipeline's path. Coating is applied to the ends of the pipes. The coating applied at a coating mill typically leaves the ends of the pipe clean, so as not to interfere with welding. Finally, the entire coating of the pipe is inspected to ensure that it is free from defects.

1. What does building pipelines allow?
2. What process is called 'stringing' the pipe?
3. What is the final step of Pipeline Construction?

2. Give English equivalents to the Russian words and word combinations:

Использование природного газа увеличивается; установка трубопровода; строительное оборудование; сварки секций трубопровода; препятствия; толщина трубопровода; покрытия; толщина трубы; проверка трубы; отрывать траншеи.

3. Translate the following sentences into English:

1. Выкапывается траншея глубиной 5-6 футов и укладывается труба.
2. Трубы свариваются в единый трубопровод.

4. Match the words (A) with the appropriate definition (B)

A	B
pipe	1) oxidation of metals in reaction with oxygen;
corrosion	2)) a line of connected pipes for carrying oil or gas along;
coating	3) a tube used for carrying liquids or gas;
pipeline	4) to join by pressure or melting together when hot;
to weld	5) a covering on or over surface.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the pipeline construction. It should last for about a minute and include 10 phrases.

TEXT 24. LAYING PIPE ACROSS STREAM OR RIVERS

1. Read the text carefully and answer the following questions:

Laying pipe across streams or rivers can be accomplished in one of two ways. Open cut crossing involves the digging of trenches on the floor of the river to house the pipe. When this is done, the pipe itself is usually fitted with a concrete casing, which both ensures that the pipe stays on the bottom of the river and adds an extra protective coating to prevent any natural gas leaks into the water.

Alternatively, a form of directional drilling may be employed, in which a 'tunnel' is drilled under the river through which the pipe may be passed. The same techniques are used for road crossings - either an open trench is excavated across the road and replaced once the pipe is installed, or a tunnel may be drilled underneath the road.

Once the pipeline has been installed and covered, extensive efforts are taken to restore the pipeline's pathway to its original state, or to mitigate any environmental or other impacts that may have occurred during the construction process. These steps often include replacing topsoil, fences, irrigation canals, and anything else that may have been removed or upset during the construction process.

The last step in pipeline construction is the hydrostatic test. This consists of running water, at pressures higher than will be needed for natural gas transportation, through the entire length of the pipe. This serves as a test to ensure that the pipeline is strong enough, and absent of any leaks of fissures, before natural gas is pumped through the pipeline.

1. Why is the pipe fitted with a concrete casing?
2. What is the last step in pipeline construction?
3. What does hydrostatic test consist of?

2. Give English equivalents to the Russian words and word combinations:

Копать траншеи; положить трубы на дно реки; трубу покрыть бетонным покрытием; чтобы предотвратить утечки в воду; окружающую среду; строительный процесс; давление; вдоль трубы; удалить; использовать технику.

3. Translate the following sentences into English:

1. Трубу покрывают бетонным покрытием, чтобы предотвратить утечку газа в воду.
2. После укладки трубопровода проводят гидравлические испытания.

4. Match the words (A) with the appropriate definition (B)

A	B
pressure	1) a machine for forcing liquids, air or gas into or out of smth.;
pipe	2)) a line of connected pipes for carrying oil or gas along;
coating	3) a tube used for carrying liquids or gas;
pipeline	4)) a covering on or over surface;
pump	5) the action of putting force or weight onto something.

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a dialogue about the laying pipe across streams or rivers. It should last for about a minute and include 10 phrases.

TEXT 25. OIL GAS AND ENVIRONMENT

The picture many people have of the oil industry is a negative one of disasters reported in the media oil slicks from tankers, birds covered in oil, oil gushing from the ground, or pillars of smoke rising from a fire. The truth is very different. The world's daily consumption of oil is around 90 million barrels , and the overall impact of its production is very low . The industry puts environmental protection high on its list of priorities. From planning the recovery of new resources , through design and construction and operation and eventual decommissioning and disposal of assets, all aspects of the environment are considered in order to minimize the industry's impact. Before licences are granted by governments for exploration or production of reserves on their territory, oil companies must demonstrate how the particular environment will be protected .The companies also have an obligation to consider the impact of their operations on the global environment.

Many desert and arctic areas are home to fragile, unique plant and animal species. Oil companies have their own specialists and work with other local and international experts to study the particular environment and how it should be protected. Soil protection, breeding and nesting sites, and migration routes have to be preserved from the disruption caused by exploration and production. When permanent installations are constructed , they are usually planned to operate for periods of around twenty years. Often large amounts of cooling water are used that may change the environment. More favourable conditions may be created for invasive plants or different species that can overwhelm native species. Waste materials have to be disposed of safely. Another perception of the industry is symbolized by the flaring of gas. There are international agreements to minimize flaring to decrease pollution and conserve resources, but flaring will always be required for emergencies to dispose of unwanted gas safely.

Companies also have to allow for unplanned events and emergencies. Designers must provide controls and instruments to allow for equipment failures. Plant must be designed to allow for unlikely but possible severe conditions that might only occur every twenty years, for example, extreme wave heights, extreme temperatures, or earthquakes. Technical and management systems have to be in place to ensure that the harmful effects of human error in operating procedures are minimized .

Many installations are close to residential areas, and apart from the safety implications, companies must minimize traffic, noise, and odours and generally develop good neighbourly relations. Most companies are keen to sponsor local events, educational initiatives, and opportunities to listen to local opinion and advice. Major oil companies realize that their long-term future is in more sustainable forms of energy. Far-Sighted companies have the financial motivation, resources ,and the expertise to make a major contribution to the global environment.

1. What disasters are facing the world of today?
2. What ways are there for environmental protection in the companies?
3. Who is responsible for minimizing harmful effects of human error in operating procedures?

2. Give English equivalents to the Russian words and word combinations:

Нефтяные пятна; клубы дыма; ежедневное потребление нефти; благоприятные условия; отходы должны быть надежно утилизированы; сжигание газа; чрезвычайная ситуация; вредные воздействия; устойчивые источники энергии.

3. Translate the following sentences into English:

1. Защита почвы, размножения и мест гнездования и путей миграции должны быть сохранены от разрушения, вызванного разведкой и добычей.
2. Компании обязаны учитывать воздействие их деятельности на окружающую среду.

4. Match the words (A) with the appropriate definition (B)**A**

a safety procedure
a risk assessment
a protection programme
an eco-hazard
a nature reserve

B

- 1) a report about possible dangers
- 2) something that can harm the environment
- 3) a way of doing things to prevent accidents
- 4) an area where plants and animals are protected
- 5) a plan to work in a way that keeps animals and the environment safe

Get Talking

1. Find all the sentences where the professional terminology is used, read and translate them. Write the professional terminology.
2. Make up a plan to the text. Prepare reports about environment protection in the oil and gas companies.

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