

## Technical translation teaching of engineering students in oil and gas sphere

Traducción técnica, enseñanza de estudiantes de ingeniería en la esfera del petróleo y el gas  
Ensino de tradução técnica de estudantes de engenharia na área de petróleo e gás

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### Abstract

The article deals with typical mistakes made by engineering students translating technical texts. The study was performed within the framework of the "Foreign language" course for students of Oil and Gas Business faculty.

The analysis was provided for the texts translated by the engineering students in oil and gas industry. The study covered 40 students (I-II courses) at the Branch of IUT in Surgut. The author focuses on the main mistakes: translation difficulties caused by the structural features of the English sentence; difficulties of translation due to the characteristics of the part of speech; lexical difficulties and describes every type of mistakes in students' translations. This study is considered to be relevant as its outcomes can be applied during developing and planning the course "Foreign Language" for engineering students.

**Keywords:** translation, technical text, error, algorithm, methods of teaching translation.

### Resumen

El artículo trata sobre los errores típicos cometidos por estudiantes de ingeniería que traducen textos técnicos. El estudio se realizó en el marco del curso "Idioma extranjero" para estudiantes de la facultad de Negocios de Petróleo y Gas.

El análisis se proporcionó para los textos traducidos por los estudiantes de ingeniería en la industria del petróleo y el gas. El estudio cubrió a 40 estudiantes (cursos I-II) en la Rama de IUT en Surgut. El autor se centra en los principales errores: dificultades de traducción causadas por las características estructurales de la oración en inglés; Dificultades de traducción debido a las características de la parte del habla. dificultades léxicas y describe todo tipo de errores en las traducciones de los estudiantes. Este estudio se considera relevante ya que sus resultados se pueden aplicar durante el desarrollo y la planificación del curso "Lengua extranjera" para estudiantes de ingeniería.

**Palabras claves:** traducción, texto técnico, error, algoritmo, métodos de enseñanza de la traducción.

### Resumo

O artigo trata dos erros típicos cometidos por estudantes de engenharia que traduzem textos técnicos. O estudo foi realizado no âmbito do curso "Língua Estrangeira" para alunos da Faculdade de Petróleo e Gás. A análise foi fornecida para textos traduzidos por estudantes de engenharia na indústria de petróleo e gás. O estudo cobriu 40 alunos (cursos I-II) no ramo IUT em Surgut. O autor enfoca os principais erros: dificuldades de tradução causadas pelas características estruturais da sentença em inglês; Dificuldades de tradução devido às características da parte da fala. dificuldades lexicais e descreve todos os tipos de erros nas traduções dos alunos. Este estudo é considerado relevante, pois seus resultados podem ser aplicados durante o desenvolvimento e planejamento do curso de "Língua Estrangeira" para estudantes de engenharia.

**Palavras-chave:** tradução, texto técnico, erro, algoritmo, métodos de ensino de tradução.

## Introduction

A special place among the practical skills of a foreign language in a technical university is occupied by the skills of translating scientific and technical texts. Therefore, learning these skills should be given serious attention in the integrated process of learning a foreign language.

Technical translation requires the translating knowledge in the professional field, orientation in terms. Since the meaning of the same terms differs in relation to each of the areas of scientific and technical knowledge. Students should not only perfectly understand the text, but also accurately state it, as standards of documents require, therefore, excellent knowledge of both the original text language and the translation language is necessary (Alekseeva, 2008).

Most issues of teaching the translation of scientific and technical texts in higher education have long been discussed by specialists all over the world.

Specialists offer methods of teaching translation in a non-linguistic university.

Alferova D.A. offers Modular training in the translation of scientific and technical texts using information technologies (Alferova, 2010).

Fedotkina, E. V. uses modern electronic learning tools when working with a foreign language scientific and technical text (Fedotkina, 2010; Alipichev et al, 2007).

(Gavrilenko, 2015) proposes the use of the methodology for implementing the competence approach in teaching translation.

Bryksina, I.E., & Sukhanova, N.I. reveal the content of learning to translate from the standpoint of bilingual teaching of foreign languages based on the mechanism of bilingualism, which allows activating sign, denotative or situational connections of lexical units of native and foreign languages, developing bilingual skills among students and skills necessary to overcome interference and enhance background knowledge of the specialty (Bryksina & Sukhanova, 2014).

Anosova, N. E. considers the typical difficulties of the English-Russian scientific and technical translation (Anosova, 2010).

(Gavrilenko, 2015). Methods of implementation of competence-based approach in teaching translation. Bulletin of the Moscow State Linguistic University, (14 (725)).

Many teachers analyze students' mistakes while translating texts (Galetskaya, 2004).

Fufurina, TA identified the specific use of "false friends" in scientific and technical texts, gave examples of the false translation of scientific terms in English (Fufurin, 2015; Yakshuk, 2012; Tarasova, 2015).

Kunilovskaya M.A. differentiates between "errors that lead to inconsistencies in the translation content to the original" and "errors that reduce the quality of translation as an independent text and violate other regulatory translation requirements that are not related to equivalence" (Kunilovskaya, 2008).

## Methodology

The purpose of this article is to analyze the texts of translations of engineering students on the subject "Oil and Gas Industry". The study involved 40 students of the faculty Oil and gas business of the Branch of IUT in Surgut.

The research material was scientific and technical texts in the field of oil and gas industry. The criteria for correct translation were the following skills and abilities: 1) complete and accurate transfer of the meaning of the source text; 2) the correct search for interlanguage equivalents of the term and expression; 3) the correct design of speech (grammar, syntax and style).

In order to identify typical mistakes made when translating scientific and technical texts, the author analyzed the texts offered to students in the learning process (Kalyanova, 2016). Texts were of different levels of complexity, content, included complex grammatical constructions, turns, terms, etc. The quality of translation was evaluated by using sentences that correctly reflect the meaning of the original and do not contain semantic errors.

## Results

When translating technical texts by students of engineering specialties, an understanding of the text consists of an understanding of the

components of its proposals. The meaning of the sentence is determined by: a) the meaning of the words in it, b) their connections and functions in the sentence, i.e. the structure of the sentence. The structure of the sentence is manifested in the formal features of both the sentence itself and its member words. In English, the formal features are: forms of verbs, all inclined words, combination and coordination of forms of words, word order in a sentence, official words, punctuation, etc. From the totality of these formal features, students can determine the structure of a sentence or the ratio of words in it and the ratio of word meanings. Knowing the basics of grammar, syntax, formal features of words and sentences, even without knowing the meanings of words, you can see in the text, not yet grasping their meaning, and make a translation. In the native language, the formal signs of the word and sentence are familiar to us; therefore, the structure of the sentence is understood by us even when it consists of meaningless words.

For students studying a foreign language it is especially important if the sentence structure, even if it is not filled with specific word meanings, still gives a general idea of its content, i.e., knowing the meaning of words without understanding their connections and functions in a sentence does not give anything understanding the proposal.

In comparison with the Russian language, the English language has an intrinsic clear, defined by a number of rules the structure of the sentence, which causes difficulties in learning English.

For example, we provide the following examples of engineering students at the Branch of IUT in Surgut:

- in the declarative sentence in the first place is usually the subject, in the second - predicate, in the third - addition, in the fourth – adverbial modifier.

I    II                    III  
IV

Brazilian delegation visited our laboratories yesterday.  
Делегация из Бразилии посетила наши лаборатория вчера.  
The attribute is either before or after the word being defined.

The new device works well.

Новый прибор работает хорошо

The method used gives good results.

Используемый метод дает хорошие результаты.

In the event of the adverbial modifier of place and time, the adverbial modifier of place precedes the adverbial modifier of time, or may also be the subject.

I shall spend my leave in the Crimea this year.

В этом году я проведу свой отпуск в Крыму.

This year I shall go nowhere.

В этом году я никуда не поеду.

Despite the fact that in the English sentence there is a direct word order, a departure from this usual word order, it may not be arbitrary and subject to certain rules.

The main type of deviation from the usual order of the sentence members is the rearrangement of the subject and the predicate in places: the subject is placed after the predicate. This arrangement of the main members of a sentence is called "reverse order" or "inversion".

Inversion is applied when a sentence begins with an introductory particle, there, with an introductory pronoun it in some types of sentences, as well as in emotional highlighting or underlining of the sentence members.

Reverse word order in sentences beginning with the introductory particle there.

In such sentences, starting with there, the predicate takes its place in front of the subject, and the subject follows the predicate. The verb-predicate is consistent with the following noun, bearing the function of the subject.

The introductory particle there is usually found in sentences, the predicate of which is expressed by the verb (to) be.

There are three methods of rotating work engine lathes, which may be referred to as turning between centres chuck work and face plate work.

Существует три способа удерживания и вращения токарных станков с рабочими двигателями, которые можно назвать поворотными между центрами гибания заготовки и работой лицевой панели.

No flow of water occurs through the pipe unless there is a difference, in pressure. В трубопроводе происходит движения (потока) воды, если нет разности давлений.

There are cases where the external forces are known with good accuracy. Существуют случаи, когда внешние силы известны с достаточной точностью.

Before the predicates, which include the modal verb, as well as before the predicates, pronounced verbs exist (существовать), remain (оставаться), arise (подниматься), come (приходить) and some others also have an introductory particle there.

With this fixed number of protons there may be associated a varying number of neutrons. С этим постоянным числом протонов может быть связан разное число нейтронов.

To hold the free-body portion in equilibrium there must be a force  $V$  and a couple  $M$  acting at the cross section. Чтобы удержать в равновесии часть тела, лежащую свободно на опорах, должна быть сила  $V$  и пара сил  $M$ , действующие в поперечном сечении.

There results in this way a more or less steady stream of water through the delivery pipe. Таким образом, образуется более или менее постоянно текущая вода по напорной трубе.

There exist many sources of energy both potential and kinetic. Существует много источников энергии как потенциальной, так и кинетической.

There may be two magnets, one above and one below the disk, carrying respectively pressure and current coils. Могут быть два магнита, один выше, другой – ниже диска, несущие соответственно катушку напряжения и катушку тока.

Reverse word order is allowed in conditional subordinate sentences, if there is no if statement and if the predicate is expressed by a verb to (have) or (to) be or a complex form of the verb, as well as with a complex verb predicate that includes the modal verb.

Reverse word order is allowed in conditional subordinate sentences, if there is no conjunction if statement and if the predicate is expressed by a verb to (have) or (to) be or a complex form of the verb, as well as with a complex verb predicate that includes the modal verb.

Were there no loss of energy by friction, the motion would continue indefinitely once it had

been started.  
Если бы не было потери энергии на трение, движение продолжалось бы бесконечно, коль скоро оно началось.

Reverse word order is also allowed when highlighting a minor member of a sentence in order to underline it. The selected member of the sentence is transferred to the beginning of the sentence, then the predicate goes, and the subject stands after the predicate.

To a field is added another field containing 3 acres. К полю добавляется другое поле в 3 акра.

To this class of substance belong mica, porcelain, quartz, glass, wood, ebonite, etc. К такому роду веществ принадлежат: слюда, фарфор, кварц, стекло, дерево, эбонит и т. д. In front of this screen CD are placed two screens FR and PQ, each with a small hole at the center. Перед этим экраном CD помещаются два экрана FR и PQ, каждый с небольшим отверстием в центре.

Hence arises the difficulty of obtaining sound castings of copper. Отсюда возникает трудность получения добротных отливок меди.

But having become acquainted with these rules, having mastered them, students gain knowledge for understanding the meaning of the English sentence. At the initial stage of learning the translation of technical texts, it is necessary to strictly adhere to the recommended rules. A solid knowledge of the rules and constant training in applying them leads to the creation of analysis skills during a cursory reading with a view to further translation of the text.

When learning to translate from English into Russian, knowledge of the grammatical structure of the sentence takes a great part. Learning to read easily and quickly translate the text in English means learning quickly, automatically recognizing the structure of the English sentence by formal signs.

We have compiled an algorithm for translating technical literature for students studying English at our university.

Algorithm for translation work.

1. Read the text or paragraph and try to understand the general content.

2. Find complex sentences in the text and break them into separate sentences, namely: complex sentences into the main and subordinate, and complex sentences into simple sentences.

3. Determine the group of the predicate and the subject. The border between them passes between the verb in personal form with explicit verb signs (presence of auxiliary verbs to be, to have, to, should, modal verbs and their equivalents) or homonymous signs (that is, words with endings - ed , -ing, -s):

- ✓ find the variable part of the predicate;
- ✓ find the unchangeable part of the predicate;
- ✓ find the subject on the basis of the nominative parade of a noun or pronoun in the preverb or post-verbal part;
- ✓ check the agreement between the predicate and the subject in form and meaning;
- ✓ to separate the subject group;
- ✓ to separate the group of the predicate into a verb-predicate, the object and adverbial modifier, i.e., either the whole verbal part (with direct word order), or the whole pre verbal part (with reverse word order and subject group, which occupies the whole verbal word), or the remainder after verbal the parts after the separation of the group of the subject in combination with the member of the group of the predicate in the verbal part.

4. Determine the presence of revolutions (participial, infinitive, or gerundial).

5. Start translating the sentence from the subject group, then the predicate group, the object and the adverbial modifier.

6. Find unfamiliar words in the dictionary, determine which part of the speech they are, select the most suitable translation. Pay attention to the terms, neologisms, false friends of the translator.

7. In case of difficulties in translation, refer to the specialty reference books.

Such work has yielded positive results, but students face some difficulties. Analyzing translations of students, we identified the difficulties and mistakes that students make when translating technical texts:

- difficulties of translation due to the structural features of the English sentence

- difficulties of translation, due to the peculiarities of the part of speech;  
- lexical difficulties.

Lexical difficulties.

1. The use of neologisms in technical texts, namely, new words or phrases that have appeared in the language as a result of the development of science. The students' error in translating neologisms is due to the fact that they are not yet registered in dictionaries and it is difficult for students to establish their meaning. To do this, the student needs not only to analyze the structure of the word, but also to establish the method of education, analyze the context, and use reference literature to determine the meaning.

2. Workload of technical text with terms, terms and phrases. In this case, the student must demonstrate interdisciplinary knowledge, as a competent technical translation requires professional knowledge of the relevant professional field. As in the text there are terms-phrases, both components of which are words of a special dictionary, but the term-phrase, consisting of these components, acquires a new meaning, possessing a certain semantic independence, for example: brake gear - тормозноеоборудование; electric motor - двигатель, приводимый в действиеэлектричеством.

Students, in turn, translate them in separate terms, without understanding to what area the term-phrase belongs. It is difficult for students to define the scope of a term, when the first component of a term-phrase can be used in its usual meaning, the second component can be a term used in several fields of science. For example:

1. controlling valve клапандлявпускагаза (ав.)
2. control valve управляющаялампа (рад.)
3. exhaust valve выпускнойклапан (гидротех., теплотех.)
4. safety switch аварийныйвыключатель (эл.)
5. locked switch закрытаястрелка (ж.-д.)
6. change-over switch переключатель (эл.) (Pronina, 1986).

Difficulties of translation, due to the structural features of the English sentence.

Definitions of the main members of sentences and their groups. For example, difficulties in

determining the predicate are caused, first of all, by the complex form of the composite predicate, which is divided into a compound nominal and compound verbal predicate. A compound nominal predicate consists of a verb-link (expresses the verbal category of a person, a number, a tense and a mood) in a personal form and a nominal part.

For example: The purpose of lubrication is to reduce the friction between moving surfaces. Назначение смазки состоит в том, чтобы уменьшить трение движущихся поверхностей. The mobility of ions is inversely proportional to the pressure. Подвижность ионов обратно пропорциональна давлению.

A part of the composite nominal predicate (predicative term) can be expressed: nouns, adjectives, pronouns, numerals, infinitives, gerund, etc.

For example: The most interesting thing about semiconductor lasers is that they can transform electrical energy directly into light wave energy. Самое интересное в полупроводниковых лазерах заключается в том, что они могут преобразовывать электрическую энергию непосредственно в световую волновую энергию.

The compound verb predicate is expressed in:  
- combined modal verb, modal expressions + infinitive; modal combinations such as obliged + infinitive (Radar can be used to guide planes through darkness to their destination. Радар может использоваться для того, чтобы направлять самолеты в темноте к месту назначения);  
- the verb denoting the beginning and end of the action in a personal form + infinitive or gerund (High-frequency radio waves continue to move in a straight line from the transmitter until striking something solid. Высокочастотные радиоволны непрерывно движутся по прямой линии от радиодатчика, пока не ударятся о твердое препятствие).

Difficulties of translation, due to the peculiarities of the part of speech.

Students often make mistakes when translating non-personal forms of the verb, namely the infinitive and the infinitive constructions very close to gerund in origin. The infinitive has the properties of both a noun, can be in the sentence of the subject, the nominal part of the predicate,

the object, the attribute, and the properties of the verb, it can take a direct object, has pledge and temporal differences.

It should be noted that these revolutions are not available in Russian. Construction, consisting of a noun in the general case or pronouns in the object case + infinitive, we call "object infinitive construction, which is translated by the object subordinate clause and introduced by «чтобы», «что» или «как». There is a close logical connection between the components of this construction, allowing them to perform one syntactic function - the function of a complex object.

The noun, as well as the pronoun in front of the infinitive, acts as the underlying subordinate clause when translating, and the infinitive, respectively, as the predicate.

We give examples of infinitive constructions in which students made mistakes in translation.

We desire further cooperation of the lecturers of our university to develop successfully. Мы желаем, чтобы дальнейшее сотрудничество преподавателей нашего университета успешно развивалось (правильный перевод).

The lecturers suppose the master student to be equal to the task of translating the articles. Преподаватели полагают, что аспирант справится с переводом статей (правильный перевод).

We saw this scientific laboratory grow year by year. Мы видели, как эта научная лаборатория развивалась с каждым годом (правильный перевод).

They had their motor repaired. He wished the letter mailed immediately. Им отремонтировали двигатель. Он хотел, чтобы письмо отправили немедленно (правильный перевод).

The case in which the subject is separated from the predicate by a large group of words, and the predicate, in turn, divorced from the infinitive, also presents difficulties in translation for students. Difficult cases with predicative infinitive are translated by the same rule.

“Deformations, and especially changes of curvature, of those parts of slab in which the stresses are well below the yield stresses can be assumed with sufficient accuracy to be exceedingly small.”

С достаточной степенью точности можно предположить, что деформации, особенно изменение кривизны тех частей плиты, где напряжения гораздо ниже предела текучести, бывают чрезвычайно малыми (правильный перевод).

When translating into an example, it begins with words that originally wedge in between the predicate and the infinitive or in the composition of the predicate itself. Therefore, first-year students cannot understand the meaning of constructions, where the complex subject is combined with some other characteristic of the English language. “There can be said to be no bending moment in the members of such a type. It is said that he is an engineer; He is said to be an engineer” etc.

### Conclusion

Based on the above errors and difficulties caused by students in translating technical texts, it is necessary to formulate the problems and tasks that are in the educational process of students of engineering specialties in translation.

First of all, it should be noted that translation training is inextricably linked with all aspects of learning a foreign language: grammar, reading, listening, and writing. Obligatory requirements for high-quality translation are the observance of the norms and rules of the language being studied, since a deep knowledge of the language is a prerequisite for successful mastery of translation skills. Therefore, learning to translate technical texts should begin when students already have a certain basic language training, that is, after 2 courses, while at Tyumen Industrial University, at the Branch of IUT in Surgut, translation of technical texts is included in the program for learning the foreign language during 2 semesters, and that is not correct. In addition, a successful translation requires knowledge of the common and linguistic culture of the countries of the language being studied, the way of life of their people, and teaching proper translation should be based on a solid language and regional geography. All this will

then enable more accurate transfer of reality, stable expressions; again, this material is studied for 2-4 semesters, i.e. after learning the translation of technical texts. It is necessary to note the correct learning of foreign language grammar. When teaching grammar, the focus should be on the analysis of grammatical structures, that is, separate phrases and sentences. When learning to translate, the whole text as a whole becomes the object of analysis; students must learn to highlight the main content of the text, its communicative function before they begin to translate.

Thus, translation training should be focused on instilling in students the skill of comprehensive analysis of the text as a whole and the development of a translation strategy, the choice of its methods based on such an analysis.

Thus, there is a contradiction between the methodological aspects of teaching technical translation and the requirements being in the program of teaching foreign languages to engineering students. Only by resolving this contradiction, it is possible to avoid numerous mistakes, to teach students to make competent and accurate translation of scientific and technical texts.

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