ПРИКЛАДНА ЛІНГВІСТИКА

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PROBLEM SOLVING OF ADEQUACY AND EQUIVALENCE IN SCIENTIFIC AND TECHNICAL TRANSLATION

The article attempts to study the main solutions for the adequate and equivalent translation of scientific and technical texts. It focuses on the Ukrainian-English translation and its problem solving for the texts in Industrial and Civil Engineering field. Due to the acceleration of scientific and technological progress in the modern world this type of activity is becoming increasingly important.

The findings of this study revealed the main difficulties for the adequate and equivalent translation of scientific and technical texts. The scientific and technical literature is characterized by the use of a large number of terms that reflect the specifics of the concepts. The challenges occurred in Ukrainian-English translation are defined and analyzed. A prerequisite for adequate translation is the ability to correctly analyze the grammatical basis of a foreign sentence, correctly determine the grammatical difficulties of translation, the ability to construct a sentence in translation following the rules and genre of the original.

The aim of the research is to trace the challenges occurred in Ukrainian-English translation of scientific and technical texts and try to indicate the main probable solutions for the adequate and equivalent translation. Attention is focused on a number of common cases in the texts which may cause challenges for a translator while the grammatical reading. Targeting the adequate and equivalent translation of scientific and technical texts may be considered as the challenges occurred in Ukrainian-English translation: editing the text; information distortion; level of English proficiency; semantic complexity of the text; structural complexity of the text and other. Practical recommendations for translators of scientific and technical literature in the field of Industrial and Civil Engineering are given. The using of professional terminology is considered.

Key words: adequate and equivalent translation, Industrial and Civil Engineering field, problem solving, scientific and technical translation.

Introduction. The scientific and technical sphere is one of the vital spheres in the context of the development of new super-industrial information society [Toffler 2019 : 76]. Due to the rapid development of technology and the dissemination of scientific and technical information, the importance of scientific and technical translation has grown. Translation is a rather complex communicative process used to exchange special scientific and technical information between people who speak different languages. Misunderstanding the content of scientific research or ignorance of scientific and technical terminology can lead to distorted interpretation of the entire content. Scientific and technical translation does not tolerate the duality of meaning and distortion of terms used.

By considering the fact that the translation of scientific and technical literature differs from the translation of fiction, newspaper articles, documentary and business correspondence, a translator faces some particular challenges defined in the given article. The article focuses on the Ukrainian-English translation and its problem solving for the texts in Industrial and Civil Engineering field. As usual, a translator has a number of technical dictionaries at his/her disposal. However, to find the right term with an operating characteristic in a certain field such as Industrial and Civil Engineering (Construction Engineering, Structural Engineering, Surveying etc.) and choose the semantic nuance among the few proposed ones – it is rather challenging. Literal, or tracing, translation is rarely used.

The aim of the research is to trace the challenges occurred in Ukrainian-English translation of scientific and technical texts and try to indicate the main probable solutions for the adequate and equivalent translation.

Analysis of research. Translation of texts of scientific and technical style repeatedly became in the focus of study of the scientists who tried to give different definitions of this process. L. Barkhudarov, V. Breus, V. Komissarov, V. Koptilov, A. Fedorov greatly contributed into the development of the problem of translation in general and translation of scientific and technical literature in particular. Translation strategies were the subject of research of R. Bell, I. Bik,V. Karaban, T. Kyyak, I. Revzin, I. Gladkikh, and O. Kharitonov. However, the issue of adequacy and equivalence in scientific and technical translation and its problem solving is still insufficiently covered and needs further study.

Results and discussion. The concept of "scientific and technical literature" comprises the literature which is the principal medium for communicating the results of scientific research. It comprises scholarly publications such as monographs, collections of papers, articles on various issues of science and technology; educational scientific and technical literature (tutorials, reference books, etc.); popular science literature in various fields of technology; technical and accompanying documentation; technical advertising, patents, etc. For an engineer, PhD student or researcher engaged in scientific research, a scientific article is the main source of the obtaining and dissemination of scientific and technical information. The translation of such articles may cause certain difficulties as well. Detecting the problematic areas for the translators in the field of Industrial and Civil Engineering, the following number of common cases in practice taken for problem solving will assist a translator to overcome difficulties occurred when translated.

Problem solving in scientific and technical translation is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution. When translated, the considered examples of grammatical reading of scientific texts may comprise a number of common cases in practice when, for the translator, the meaning of the translated sentence or paragraph remains unclear.

One of the main requirements for scientific and technical translation is the accuracy, adequacy and equivalence in transmission of the meaning of a sours-language (SL) text by means of an equivalent target-language text. The criteria for adequate scientific and technical translation are clearly stated: "It must accurately convey the content of the original containing common terminology in the language of translation and comply with the norms of scientific and technical literature, the translation of which is carried out" [Kyyak 2004 : 45]. From the other point of view, the other main adequate translation requirements may be considered as the ability to correctly analyze the grammatical structure of a foreign sentence, correctly determine the grammatical difficulties of translation, the ability to construct a sentence in translation following the rules and genre of the original [Karaban 2004 : 94].

The difficulties in translation may be also caused, while transferring the correct meaning of each sentence that very often does not correspond to the literal translation [Akbari 2017 : 17]. Scientific and technical prose is characterized by a relatively lower level of semantic redundancy of the text. As a result, usually the incomprehensibility of the meaning at a lower level (for example, a sentence) leads to the incomprehensibility of the meaning at a higher level (for example, a paragraph) [Nida 1977 :100]. The following difficulties for the adequate and equivalent translation of scientific and technical texts may be considered as the challenges occurred in Ukrainian-English translation:

- editing the text;
- information distortion;
- level of English proficiency;
- semantic complexity of the text;
- structural complexity of the text.

1. Structural complexity of the text. Structurally complex text units include those text units that contain a large number of constructions, including all sorts of combinations of compound and complex sentences that are characteristic of the so-called "German" style of scientific prose. Structural-complex difficulties may also include those text units in which, for some reason, the logical sequence of presentation of the material is violated.

2. Semantic complexity of the text. Semantically complex text units include text units containing a large number of new terms, abbreviations,

jargon, or mathematical notations known only to a narrow circle of specialists. They also include scientific texts in which the meaning of verbal formulations can be revealed only if the meaning of the given mathematical calculations is understood.

3. The complex nature of the content of the text. Modern science develops most intensively at the junctions of dissimilar scientific disciplines and trends, for example, architecture, building materials, composite materials, building structures, etc. Usually a complex scientific article is written by a team of authors, each member of which has its own individual stylistic features, uses its own terminology and notation. As a result, a scientific article sometimes acquires a "piecewise" character that makes it difficult to understand even by specialists.

4. Editing the text for the removal of certain definitions and information, the author's desire only to stake out a technically given scientific direction, without reporting anything about the results actually obtained.

5. Distortion of information for reasons of market conditions, competition, advertising policy.

6. The level of English proficiency of the author of the article.

Scientific and technical vocabulary is much more complex than household and even business vocabulary. It requires a sufficient level of professional knowledge, clarity of thinking and skillful application. Good knowledge and proper mastery of special technical terminology opens up new opportunities for in-depth study of the subject for those who read and perceive professional literature [Bell 1991 : 84]. However, sometimes the other considerable difficulties arise in translation of special terms. It occurs due to the fact that in the linguistic aspect, terms, like other words of the language, have the phenomenon of ambiguity. In the language of science and technology, the phenomenon of ambiguity is widespread due to the fact that in the terminology of various branches of science and technology is widely used so-called semantic word formation, when the existing form of the word is assigned a meaning.

Example: *"Прогини балок армованих металевою арматурою, базальтопластиковою арматурою та з гібридним армуванням металевою та базальтопластиковою арматурою"* a translator may face the challenge with the using the derivatives of the Ukrainian term "*арматура/армування/армувати"* and its varieties in English. The offered translation and choosing the equivalent terms may be as following: the word combination «*армовані балки*» – here it means the beams strengthened/reinforced (with); for «*арматура*» – it is usually choice between *"reinforcement, armature"* but if it is necessary to emphasize on the metal rods as the items for strengthening, the term "armature" is better choice; for «*армування*» – as the process of concrete strengthening, the term "reinforcement" is better choice. So, the final option of the translation may be chosen as "*Beam deflections reinforced with metal armature, basalt plastic armature and hybridreinforcement using metal and basalt plastic armature"*.

Scientific and technical literature is a field of wide use of various abbreviations – both those included in the language and recorded in dictionaries, and authorial, occasional, created only for a specific case and recorded in only one text. In some types of texts, abbreviations sometimes make up 50 percent of all word usage and 15 percent of vocabulary.

Example: *"Samples by the series differed in the following features:*

– the BM series – beams reinforced by metal armature (control series);

– the BB series – beams reinforced by BFRP armature;

– the BMB series – beams with hybrid reinforcement with metal and BFRP armature;

– the BMD series – beams reinforced by metal armature using concrete on fine wastes of MBC".

Here, the abbreviations BM, BB, BMB, BMD were created only for a specific scientific article, naming the differences in the samples using different combination of armature for the concrete strengthening and recorded in only one text.

Some of the abbreviations tend to be changed with the language development.

Example: In recent translations *"MODC"* as the abbreviation for Mining Ore Dressing Combine tends to be changed into the abbreviation *"MBC"* which stands for Mining Beneficiary Complex. We can trace it in the following example: *"The samples were made of standard concrete with quartz sand as the fine aggregate and concrete with fine fraction wastes of a mining and beneficiation complex (MBC) used instead of the sand"*.

For a translator who has sufficient language training but does not have the appropriate knowledge in the relevant field of science and technology, the main difficulties will be related to understanding those parts of the text, in which the specialized issues or processing equipment are set out.

Example: "*Випробування дослідних зразків балок виконувалося на гідравлічному пресі П-125 за схемою однопрогонової вільнолежачої балки навантаженої двома зосередженими силами в третинах прогону. При випробуванні балок були використані такі прилади: прогиномір Максимова; індикатори годинникового типу з ціною поділки 0,01 мм; мікроскоп МПБ-2 з 24 – кратним збільшенням і ціною поділки 0,05 мм для визначення ширини розкриття нормальних і похилих тріщин.* / *Testing of beams was carried out on a hydraulic press P-125 according to the scheme of a single-run free beam loaded with two lumped forces in the thirds of gear. During the testing the following devices were used: the Maximov deflection indicator; engineer's dial gauge with a price of 0.01 mm readability; the MPB-2 microscope with a 24x magnification and 0.05 mm readability to determine the width of the opening of normal and inclined cracks"*.

An important role in the translation of narrow technical the text is played by the professionalism of the translator, mastery of the subject, scientific vocabulary and terminology, even a certain linguistic intuition and foresight.

Conclusions and recommendations. As usual, the concept of scientific and technical literature includes such varieties as a monograph, an article from a special journal, technical description, patents, and technical directories. The translation of such literature may cause some difficulties. A prerequisite for adequate translation is the ability to correctly analyze the grammatical basis of a foreign sentence, correctly determine the grammatical difficulties of translation, the ability to construct a sentence in translation following the rules and genre of the original.

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ВИРІШЕННЯ ПРОБЛЕМИ АДЕКВАТНОСТІ ТА ЕКВІВАЛЕНТНОСТІ У НАУКОВО-ТЕХНІЧНОМУ ПЕРЕКЛАДІ

У статті зроблена спроба дослідити основні рішення для адекватного та еквівалентного перекладу науково-технічних текстів. Увагу зосереджено на українсько-англійському перекладі та вирішенні його проблем для текстів у галузі промислового та цивільного будівництва. Завдяки прискоренню науково-технічного прогресу в сучасному світі цей вид діяльності набуває все більшого значення.

Результати цього дослідження виявили основні труднощі для адекватного та еквівалентного перекладу науково-технічних текстів. Для науково-технічної літератури характерне вживання великої кількості термінів, що відображають специфіку понять. Визначено та проаналізовано проблеми, які можуть виникати в українсько-англійському перекладі. Обов'язковою умовою адекватного перекладу є вміння правильно аналізувати граматичну основу іншомовного речення, правильно визначати граматичні труднощі перекладу, вміння побудувати речення в перекладі за правилами та жанром оригіналу.

Метою дослідження є простежити проблеми, що виникають при українсько-англійському перекладі науково-технічних текстів, та спробувати вказати основні ймовірні рішення для адекватного та еквівалентного перекладу. Зосереджено увагу на ряді поширених випадків у текстах, які можуть викликати труднощі для перекладача під час граматичного читання. Проблемами при орієнтації на адекватний та еквівалентний переклад науково-технічних текстів при українсько-англійському перекладі, можна вважати: редагування тексту; спотворення інформації; рівень володіння англійською мовою; смислова складність тексту; структурна складність тексту та інше. Наведено практичні рекомендації для перекладачів науково-технічної літератури в галузі промислового та цивільного будівництва. Розглянуто використання професійної термінології.

Ключові слова: адекватний та еквівалентний переклад, галузь промислового та цивільного будівництва, вирішення проблем, науково-технічний переклад.