

RU

Глобализация и междисциплинарный характер английских нефтегазовых терминов

Шуйцева И. А.

Аннотация. В данном исследовании предпринимается попытка описать влияние глобализации на терминологию и рассмотреть, какие последствия могут повлечь за собой эти процессы. Цель исследования – подтвердить пополнение нефтегазовой терминологии терминами из различных научно-технических областей, таких как математика, физика, химия и другие. Научная новизна заключается в поиске и анализе терминов, заимствованных из различных сфер знаний, входящих в нефтегазовую терминологию, была произведена оригинальная выборка по рассматриваемой теме. В этой выборке впервые представлены термины, заимствованные нефтегазовой терминологией, и рассмотрена трансформация значений этих терминов при их переходе в данную терминологию. В результате описывается, какие именно изменения происходят в семантике терминов, заимствованных из одной области знаний в другую. В ходе исследования заимствованные термины были разделены на три основные категории; выявлены структурные особенности этих терминов.

EN

Globalization and Interdisciplinary Nature of English Oil and Gas Terms

Shuytseva I. A.

Abstract. The study attempts to describe the impact of globalization on terminology and consider what consequences these processes can entail. The aim of the study is to confirm the replenishing of the oil and gas terminology with terms from various scientific and technical fields, such as mathematics, physics, chemistry and others. Scientific originality lies in the search and analysis of terms borrowed from various spheres of knowledge entering the oil and gas terminology. The original sampling on the subject under consideration was made. This sampling presents for the first time terms borrowed into the oil and gas terminology, and the transformation of meanings of these terms during their transition to this terminology is considered. As a result, the paper describes exactly what changes occur in the semantics of terms borrowed from one area of knowledge to another. In the course of the study, borrowed terms were divided into three main categories; structural features of these terms were identified.

Introduction

The relevance of the topic lies in the fact that the influence of a globalization process affects all aspects in a modern society: economy, politics, science, culture, production, education, etc. Linguistics, as a significant part of the humanities, is involved into a global process and is affected by globalization. Owing to the complication of technical equipment and the development of new technological processes, related primarily to automation, computerization of production, there is a need to expand the terminological tools in the oil and gas field.

Basic terms from various scientific and technical fields of knowledge can be used to denote new concepts and create new terms, while they acquire specific meanings that are peculiar to this technical field. Another way of forming new terms is the creation of original products in the field of automation and computerization and, as a result, naming of such products by these companies. In order to be aware of the development of the oil and gas industry, it is necessary to know the appropriate terminology, which is especially important for the dissemination and transfer of technical knowledge among specialists, both theorists and practitioners around the world. Since the problems of the oil and gas sector have recently become particularly acute, the relevance of this issue in the present day world becomes obvious.

The goal of the study can be achieved by considering the following tasks. The first task was to identify those areas of knowledge from which terms are borrowed into the language of the oil and gas industry, then to determine the reasons for this borrowing. The second task of the study was to identify the structural features of terms borrowed

from the non – oil and gas industry, and the third task was to determine what semantic changes occur with borrowings. By viewing industry-specific English-Russian dictionaries and scientific articles on oil and gas topics, terms were to be identified from those areas of science and technology that replenish the sublanguage of the oil and gas industry.

The method of structural analysis, the method of semantic analysis, the method of linguistic description, the quantitative method and the continuous sampling method were used to accomplish tasks in this study.

The works by the authors mentioned below served as a theoretical background that enabled achieving proper results in this study. The paper by the eminent terminologist L. B. Tkacheva (Л. Б. Ткачева (1987)), who stood at the origins of Omsk terminological school, presents the description and analysis of structural features of terms in science and technical fields. The work by A. V. Abregova, R. B. Kennetova (А. В. Абрегова, Р. Б. Кеннетова (2017)) gives an idea of term formation in interdisciplinary sciences in modern English, the authors consider what semantic changes occur with those terms, using specific examples from the area of knowledge under study. A. A. Pozdnyakova (А. А. Позднякова (2011)) examines common language processes, such as borrowing, abbreviation, the language problems, which reflect the global nature of the modern language. S. V. Elkin and V. V. Kulikov (С. В. Елкин, В. В. Куликов (2006)) discuss the possibility to transfer knowledge between different subject areas, the process of universalization of knowledge, which requires universalization in the field of terminology.

The practical value of the work lies in the fact that its results can be used in foreign language classes, in the preparation of thesis on terminological topics, in special courses on terminology.

Results and Discussion

The term globalization was coined by T. Levitt (1983), who used the word “globalization” in the article published in the Harvard Business Review in 1983 to describe the integration of markets for goods that were produced by major transnational corporations. It is worth noting that Ronald Robertson (1992) began to deal with this phenomenon in the mid-60s and published his book “Globalization: Social Theory and Global Culture” in 1992. This phenomenon seems to be quite complex and ambiguous for researchers from various fields of knowledge. The idea of uniting different states, peoples, nations into a single world community may seem quite rational, expedient and attractive in many aspects. Nevertheless, this concept raises many questions and concerns in the course of its implementation.

One of the consequences of global processes in modern world is a mutual influence of languages owing to a free movement and interaction of representatives of various peoples in the field of science, production, culture, trade, tourism and other areas. The unifying principle for the communication of representatives of various countries is the English language. Obviously, the English language has become one of the tools of globalization because English-speaking countries are ahead of other states in economic, scientific and technological development. According to V. V. Kabakchi (В. В. Кабакчи (2000)), this is an objective and inevitable process since at this stage the English-speaking world is succeeding in its development. Many terms are created in English and then spread around the world. We should agree with V. V. Kabakchi that globalization is an objective process in the development of the modern world order, including linguistics. Terminology as an integral part of linguistics is fully affected by linguistic globalization.

Another consequence of linguistic globalization is the need to universalize the language, which refers to the creation of a single generally accepted, understandable system of language components (Позднякова, 2011, p. 277). L. B. Tkacheva (Ткачева, 2006, p. 169) drew attention to the need for universalization, she believed it to be one of the main tasks in achieving mutual understanding between specialists from various fields of knowledge to overcome the terminology barrier, that is the need for universalization and standardization of terms.

According to S. V. Elkin and V. V. Kulikov (Елкин, Куликов, 2006), solving the problem of universalization and standardization of terms can help to create support systems for scientific research, to achieve mutual understanding between scientific theorists and practitioners, which will promote new discoveries and developments. Terms, being a tool of scientific activity, cannot exist separately even within the same scientific and technical field. Scientists, researchers of one technical discipline can use terms related to the field of exact sciences, for example, mathematical, physical, chemical ones, etc. Due to the fact that scientists try to find solutions to problems based on an integrated approach, the attitude towards linguistic tools used in the course of solving scientific and technical problems also changes.

According to A. V. Abregova and R. B. Kennetova (Абрегова, Кеннетова, 2017), the tendency to unite the efforts of representatives of various sciences is natural and expedient, highlighting an interdisciplinary approach as a solution to the problems of modern society. From the viewpoint of A. G. Shestakovich (А. Г. Шестакович (2019)), interdisciplinary cooperation of scientists and practitioners from various fields of activity can lead to breakthrough solutions both in the field of fundamental research and in the practical field of application in solving economic, industrial, social and political issues.

Specialists from different fields of knowledge should have appropriate terms understandable by representatives of different sciences and fields of activity to interact successfully. There are terminological units that easily function in an interdisciplinary space, for example: base, process, figure (Multitran Dictionary, 2022), etc.

The study revealed that **physical terms** are actively used in the sublanguage of the oil and gas industry, for example: *generator, dispersion, gas, flow, film, pulse* (ABBYY Lingvo Live, 2022);

mathematical terms:

factor, figure, equation, percent (Александров, 2001);

terms from the field of **chemistry:**

dissolve, agent, distill, fraction, catalysis (Бушмелева, Генг, Карпова et al., 2015).

It should be noted that semantics of basic terms borrowed from scientific and technical disciplines can retain the original meaning, but more often such borrowings acquire a more specific meaning when adopted to another branch of knowledge.

There are terms borrowed from various disciplines that have not changed their original meaning in the terminology system of the oil and gas industry, for example:

pipeline (phys.)

pump (phys.)

hydrocarbon (chem.) (ABBYY Lingvo Live, 2022)

number (math.)

sector (math.)

formula (math.) (Александров, 2001).

Interdisciplinary terms that have changed their meaning in respect of clarifying or expanding the semantics after entering the terminological system under study can be represented by the following examples: *dispersion* as a physical term is translated as ‘scattering (of light)’ (АФФС, 2010-2022).

In the oil and gas terminology, the same term means ‘dispersion of clay particles in a solution’ (Булатов, 2004). Thus, this term in the described terminology acquires a more specific meaning, which stands for ‘grinding of solids or liquids, forming powders or emulsions’.

The term *fraction* in mathematics means ‘a number that results from dividing one whole number by another’ (Cambridge Dictionary, 2022), in chemistry it stands for ‘a quantity of liquid that has been collected because of a process that separates the parts of a liquid mixture’ (Oxford Learner’s Dictionaries, 2022). In the oil and gas terminology this term is translated as ‘a fraction, a partial product of distillation’. In this case, the meaning of the term *fraction* in the oil and gas industry acquires a narrower special meaning related to a specific technical industry (Булатов, 2004).

The term *decomposition* is used both in the chemistry and physics terminology, in the physics terminology, it is translated as ‘splitting’ (АФФС, 2010-2022), and in the chemical terminology the term’s translation is ‘breaking something into smaller parts’ (Cambridge Dictionary, 2022). The same term in the oil and gas terminology besides the meaning of splitting denoting the process of physical change in a substance structure has a narrower special concept, namely ‘cracking’ (Булатов, 2004), i.e. a special process of separating a substance (oil) into components containing smaller molecules using a high temperature.

The examples of interdisciplinary terms used in the oil and gas terminology confirm the trend of specifying the meaning of original terms when such terminological units enter another terminological system. Thus, there is not always a pure “mechanical” borrowing of terms from one field of knowledge into another. Borrowed terms adopted in the new terminological system undergo a kind of semantic and structural changes.

Practical examples should be considered to support this assumption. One of the most productive ways of term formation, according to L. B. Tkacheva (Ткачева, 1987), is terminological combinations. Terminological combinations consisting of interdisciplinary terms are actively used in the oil and gas terminology.

For example: *octane number* (Булатов, 2004); this terminological combination consists of two terms – octane (chem.) (ABBYY Lingvo Live, 2022) and number (math.) (Александров, 2001). According to the Cambridge Dictionary (2022), a *number* shows the quality of petrol by representing how well and with how much power it can make an engine work. There are no structural changes in this combination of terms, although it provides for a special concept in the oil and gas terminology when these terms are combined.

The terminological combination *impact number* according to ABBYY Lingvo Live Dictionary (2022) means a specific impact strength and refers to the physics terminology. The same terminological combination (TC) is used in the oil and gas terminology and means almost the same with some clarification i.e. ‘the value of impact strength’ (Булатов, 2004). Separately, these terms are used in mathematics – a number (Александров, 2001) and in physics – an impact (ABBYY Lingvo Live, 2022), when combined, these two single components enter into the physics terminology as a term combination, which is borrowed into the oil and gas terminology with the clarification of meaning.

The examples given above are an illustration of terms that were borrowed from fundamental scientific disciplines such as mathematics, physics and chemistry. Due to the increasing complexity of production processes and equipment, including the oil and gas sector, scientists are looking for ways to optimize and improve technological processes using modern achievements in science and technology. One of the ways to solve the tasks is the use of computer technology and automation of production. As a result, computer terms flow into other areas of knowledge, in this case into the field of oil production and oil refining.

The following examples give an idea of the borrowing of computer technology terms into the oil and gas terminology.

SCADA (*Supervisory Control And Data Acquisition*) (ABBYY Lingvo Live, 2022).

The abbreviation of the terminological combination is borrowed from the terminology of computer technology and programming into the field of oil and gas production and means ‘supervisory control and data collection for main pipelines’ (Multitrans Dictionary, 2022). In relation to the oil and gas sector, the meaning of this abbreviation changes towards clarification, operations relate to a more specific area of application, that is the semantic scope of the term narrows.

ERP (*Enterprise Resource Planning System*) (Multitrans Dictionary, 2022). This terminological combination can be referred to interdisciplinary terms, since it can be used in various industries, including the oil and gas sphere.

Safety Valve Scout is a special application of the Honeywell Corporation for a valve control (Першин, Сорокин, 2010). This application was developed specifically for the maintenance of oil and gas pipelines, to monitor the operation of safety valves in problem areas of oil and gas collection and to generate reports based on the data obtained.

PCC (Production Control Center) is an application developed by the Honeywell Corporation. The system is designed in such a way that all information received from sensors at oil and gas facilities is available at any time to those employees who make decisions at the appropriate levels of management (Першин, Сорокин, 2010).

APC (Advanced Process Control) (Multitran Dictionary, 2022). The term combination *process control*, that is a regulation of the course of a technological process (used in the field of physics and computer technology (ABBYY Lingvo Live, 2022)), is borrowed into the oil and gas industry as a basic terminological combination obtaining a specifying component *advanced*. APC is based on an IT system that presets and maintains the most optimal mode of operation from both a technical and economic point of view. APC is successfully used in oil refining, oil and gas recovery, and field treatment of oil.

ESD (Emergency Shutdown System) – a reactor emergency shutdown system (ABBYY Lingvo Live, 2022). This abbreviation of the terminological combination was adopted into the oil and gas terminology from the physics vocabulary, in the oil and gas context, it is translated as ‘a well emergency shutdown system’ (Multitran Dictionary, 2022). Thus, the meaning of this terminological combination changes in terms of clarification referring to a specific oil and gas facility.

MES (Manufacturing Execution System) is an automated production process control system (computer engineering and software) (ABBYY Lingvo Live, 2022). In the oil and gas industry, this terminology abbreviation is translated as ‘an automated system of (operational dispatch) production control’ (Multitran Dictionary, 2022). In this instance, the semantics of the terminological combination does not change dramatically in case of borrowing to the considered production area.

Production Balance is a Honeywell application that provides for more accurate product measurements without extra costs for expensive equipment (Першин, Сорокин, 2010). The application helps to solve such problems as the consistency of measurement readings in different process areas and to determine the accuracy of product measurements obtained from wells.

Profit.PLUS (the Honeywell Corporation software) is used to control oil and gas process units based on Advanced Process Control (APC) technologies (Першин, Сорокин, 2010). This software product was also named by Honeywell.

Conclusion

Thus we have come to the following findings.

According to the first task of the study, it has been found that the terms and terminological combinations identified in the language of the oil and gas industry are borrowed from such fields of knowledge as physics, chemistry, mathematics and computer technology. The reasons of this process consist in further development, improvement, automatization and computerization of the oil and gas industry, which entails the formation of new terms.

The conclusions given below are the result of solving the second task presented in the study. The following structural features of interdisciplinary terminological combinations have been revealed because of a continuous review of specialized English-Russian dictionaries and scientific articles. Most of terminological combinations are represented by two-component terminological combinations, for example, impact number, octane number, production balance (70%), three-component terminological combinations make up 6% of sampling (safety valve scout, production control center). One-component terminological units account for 24% of the sample, for example, dispersion, fraction.

The results of solving the third task are as follows: terms and terminological combinations are borrowed from one scientific and technical field of knowledge to the oil and gas area, either retaining the original meaning (enterprise resource planning) or acquiring a more special meaning (emergency shutdown system – emergency well shutdown system).

One-component terms borrowed from one discipline to the discipline under study, as a rule, do not change their semantic content (pump, number).

Based on the fact that terminological combinations borrowed from different scientific and technical disciplines consist mainly of two components, we can assume that such a compact structure is sufficient to express and convey the necessary special semantic meaning of processes and phenomena of a particular technical field.

Thus, by using specific examples, the study confirms that the oil and gas terminology is replenished with terms from various scientific and technical fields of knowledge.

Further research perspectives lie in a further study and analysis of terms and terminological combinations that are likely to replenish the oil and gas terminology mostly with computer terms due to a computerization of oil and gas production and an interdisciplinary integrated approach that is used by scientists from various fields of scientific knowledge.

Источники | References

1. Абрегова А. В., Кенетова Р. Б. Особенности формирования терминов междисциплинарных наук в современном английском языке (на примере терминов биомеханики) // Филологические науки. Вопросы теории и практики. 2017. № 4-1. URL: <https://www.gramota.net/materials/2/2017/4-1/13.html>
2. Александров П. С. Англо-русский словарь математических терминов / под ред. П. С. Александрова. Изд-е 3-е, стереотип. М.: Мир, 2001.

3. Англо-русский физический словарь (АРФС). 2010-2022. URL: <https://eng-rus-physics-dict.slovaronline.com>
4. Булатов А. И. Англо-русский и русско-английский нефтегазопромышленный словарь. Изд-е 2-е, испр. и доп. М.: Недра-Бизнесцентр, 2004.
5. Бушмелева Е. С., Генг Л. К., Карпова А. А., Рассказова Т. П. Англо-русский словарь химико-технологических терминов. 2015. URL: https://elar.urfu.ru/bitstream/10995/36053/1/978-5-7996-1474-4_2015.pdf
6. Елкин С. В., Куликов В. В. Основы методологии трансляции знаний между различными предметными областями // Препринты Института прикладной математики им. М. В. Келдыша РАН. 2006. № 73. URL: https://keldysh.ru/papers/2006/prep73/prep2006_73.html
7. Кабакчи В. В. Троянский конь последней революции // Культура. 2000. 28 сентября - 4 октября. URL: http://www.marquez-art.ru/pri_angla/trojanskij_konj.htm
8. Першин О. Ю., Сорокин Л. П. Современные тенденции в использовании компьютерных технологий в добыче нефти. 2010. URL: <https://neftegaz.ru/analysis/projects/329338-sovremennye-tendentsii-vispolzovaniia-kompyuternykh-tekhnologiy-v-dobyche-nefti>
9. Позднякова А. А. Проблемы языка в аспекте глобализации // Преподаватель: XXI век. 2011. № 2-2.
10. Ткачева Л. Б. Основные закономерности английской терминологии. Томск: Изд-во Том. ун-та, 1987.
11. Ткачева Л. Б. Терминология - единственный путь к международному сотрудничеству // Терминология в международном сотрудничестве: мат. Междунар. науч. конф. Азиатского континентального секретариата. Омск, 2006.
12. Шестакович А. Г. Междисциплинарность как фактор трансфера научных результатов в экономику // Вестник Уфимского государственного нефтяного технического университета. Наука, образование, экономика. Серия «Экономика». 2019. № 4 (30). URL: <http://usptu-bulletin.ru/index.php/bul/article/view/10108/0>
13. ABBYY Lingvo Live. 2022. URL: <https://www.lingvolive.com/ru-ru>
14. Cambridge Dictionary. 2022. URL: <https://dictionary.cambridge.org/ru>
15. Levitt Th. The Globalization of Markets. 1983. URL: <https://hbr.org/1983/05/the-globalization-of-markets>
16. Multitran Dictionary. 2022. URL: <https://www.multitran.com>
17. Oxford Learner's Dictionaries. 2022. URL: <https://www.oxfordlearnersdictionaries.com>
18. Robertson R. Globalization: Social Theory and Global Culture. 1992. URL: <https://sk.sagepub.com/books/globalization/n2.xml>

Информация об авторах | Author information



Шуйцева Инга Альфредовна¹

¹ Омский государственный технический университет



Shuytseva Inga Al'fredovna¹

¹ Omsk State Technical University

¹ oceansveta-64@mail.ru

Информация о статье | About this article

Дата поступления рукописи (received): 03.03.2022; опубликовано (published): 31.05.2022.

Ключевые слова (keywords): английские термины; термины нефтегазовой промышленности; заимствования; English terms; oil and gas industry terms; borrowings.