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#### ARTICLE

# Terminology as a Translation Problem and the General Conditions for an Adequate Translation of Terms

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#### **ABSTRACT**

The rapid advancement of science and technology influences every aspect of human activity, making the sharing of knowledge and innovative ideas among experts worldwide essential to modern scientific endeavors. As a result, scientific and technical translation has taken on a crucial role across various fields, requiring translators to have a deep level of expertise. Terminology represents a specialized collection of terms associated with specific areas of knowledge, serving as a cornerstone in the systematic study of terminological sciences. In the realms of science and technology, terminology plays a central role in compiling, documenting, and organizing terms into structured frameworks known as terminological systems. These systems create coherent, organized networks of terms that are interconnected through predefined relationships reflecting the underlying conceptual links. A significant challenge in technical translation lies in the precise interpretation of specialized terminology. Technical documents are often saturated with terms that serve as key carriers of information. Errors in translating these terms can result in misunderstandings among professionals, even within the same field. Clearly, inaccuracies in terminology translation can trigger serious repercussions, such as impeding technological workflows, derailing project implementation, or stalling the development of companies within specific industries. Through this research, terminology has been identified as a distinct lexical category whose central unit—the term—is widely recognized across academic literature as a linguistic marker used to signify specialized concepts and phenomena. Key properties intrinsic to terms have been delineated, including consistency, unambiguity, independence from contextual nuances, absence of emotional connotation, and high informational density.

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# 1. Introduction

Terms—and terminology as a whole—are at the heart of research in the field of terminology. Thus, it makes sense to view this discipline as a distinct area of knowledge. In terminology studies, we explore terms through various lenses: their typology, origins, forms, meanings, functions, and practical applications, as well as their organization and creation processes [1]. Since specialized lexemes are intricately linked to concepts within specific knowledge domains, terminology also delves into the principles that govern the formation and evolution of concepts. This includes methods for identifying conceptual systems, structuring them into classifications, and defining their content while selecting appropriate naming conventions. Given that a term's characteristics and behavior are significantly shaped by its associated terminology framework, some scholars argue for focusing on terminology itself—the comprehensive set of terms within a particular field—as the primary subject of terminology research [2].

# 2. Methodology

In this study, various theoretical and empirical methods have been employed. Initially, a thorough review of literature and sources related to translation, particularly technical translation, was conducted. Following this, the analytical method was utilized, which involves breaking down a holistic subject into its constituent parts—attributes, characteristics, properties, or relationships—to identify the key aspects of the issue under investigation.

The synthesis method, which is the opposite of analysis, was employed to integrate different elements of the research subject into a cohesive whole or system. In synthesis, the process involves not merely combining elements but also generalizing the analytically distinguished and studied features of the object.

Using the classification method, theoretical and practical materials related to the research object were organized according to their structure, revealing the primary methods and types of term translation. Additionally, the method of abstraction was applied to focus on a specific aspect of the subject, allowing for a deeper understanding of the unique characteristics of terms, structural types of oil and gas terminologies, and the strategies for their adequate translation.

Furthermore, both deductive and inductive methods were employed. Deduction is a form of reasoning that moves from the general to the specific, where generalized conclusions about the entire set of cases are drawn from a multitude of specific instances. This approach was instrumental in identifying the characteristics of the studied terms, their types, and methods of technical translation.

The comparative method was employed to analyze oil and gas terminology across three languages. This approach was utilized to identify the specific characteristics involved in the translation of oil and gas terms from English to Uzbek. Through this method, it was determined that in instances where the Uzbek language lacks sufficient internal resources for adequate translation, the resources of the Russian language are utilized to fill this gap.

Induction, conversely, is the method that derives general conclusions from specific observations. The conclusions drawn through induction reflect the common properties of all items belonging to a given class, based on the observation of a sufficiently broad array of individual facts. Factual materials were gathered from various sources, including "Russian-Uzbek dictionary of oil and gas industry terms" [3], "Oil and gas geology" [4], "Use of oil and gas wells"<sup>[5]</sup>, "Anglo-Russian dictionary of oil and gas terms"<sup>[6]</sup>, as well as materials from the journal "Узбекский журнал нефти и газа" for the year 2024. A comprehensive analysis was conducted on approximately 300 terms related to the oil and gas industry, with a primary focus on comparing onecomponent and two-component terms across English, Uzbek, and Russian languages. The objective of this comparative analysis was to identify the methods and strategies employed in the translation and adaptation of terminology within these linguistic contexts.

## 3. Literature Review

# 3.1. Terminology as a Separate Lexical Category

However, then A.V. Superanskaya notes that the search for ways to delimit the above meanings began in the 70s, as a result of which the term "terminology" was introduced to denote the 3rd, 4th and 5th concepts. The term "terminology" is often used in a broader sense. While all five definitions of "terminology" remain valid, it's important to note that the polysemy of the term is a phenomenon observed not only in Russian but also in international terminological practice [7].

S.V. Grinev-Grinevich offers a clear definition of terminology as both the study of terms and the collection of terms themselves. His perspective is widely accepted among scholars, including M.Yu. Volgina, V.M. Leychik, F.A. Tsitkina, and others. Terminology is deeply intertwined with science and cannot be separated from it. The terminological aspect of language is specifically designed to represent and articulate socially structured realities such as science, technology, art, politics, and law. According to A.V. Superanskaya, terminology is an essential tool for shaping scientific theories, laws, principles, and definitions, as well as the terms and systems that underpin them. This highlights terminology's role as a fundamental component of science and technology.

Terminological activity operates on two levels: practical and theoretical. On the practical side, its foremost goal is the systematic inventory of terms, which involves identifying, collecting, and cataloging all terms related to a particular subject area or field of knowledge, whether in its entirety or within specific fragments.

As part of this process, several tasks are performed:

- Establishing the boundaries of the selected area
- Selecting sources and identifying terms from those sources
- Lexicographic processing of terms
- Describing terms (providing all known information about them)<sup>[2]</sup>.

This work centers on the study of terminology, with its outcomes presented as a terminology system—an organized framework of terms connected through fixed relationships that reflect the conceptual links associated with these terms, as described by S.V. Grinev-Grinevich in 2008. It's notewor-

thy that E.V. Pavlova, in her analysis titled "Specificity of the Transmission of Terms of Various Types," treats "terminology" and "terminology system" as synonymous. However, the distinction made by S.V. Grinev-Grinevich appears to be both more reasonable and precise.

The most comprehensive explanation of a terminology system can be found in T.V. Nekrasova's work, "Terminological Units as a Means of the Effectiveness of Foreign Language Communication in a Professional Environment." Nekrasova defines a terminology system as a linguistic representation of a specialized domain, functioning alongside a logical model—a structure composed of interconnected concepts and definitions expressed through a system of linguistic signs<sup>[8]</sup>. A distinct terminology system serves as a representation of scientific and technical concepts within a specific subject area. It operates as a complex yet dynamically stable construct, whose primary function is to thoroughly depict the framework of knowledge or activity within that specialized field<sup>[8]</sup>.

# 3.2. The Evolution of Terminological Systems

Terminological systems, as noted by M.Yu. Volgina, undergo constant transformation and renewal, reflecting the dynamic nature of language and its adaptation to new communicative and scientific needs. In this context, certain terms are phased out in favor of more effective or precise alternatives, while others gradually fall into disuse altogether. At the same time, new terms—often neologisms—emerge to address evolving concepts and phenomena. Modern terminology represents a carefully cultivated lexical layer, where each term is subject to specific constraints regarding its application and is optimized for particular conditions that support its existence and growth [9]. This perspective resonates with S.A. Leonova's observations, who asserts that scientific and technical terminology forms the most dynamic segment of the language's lexical-semantic system. In this sphere, the generation of new terms is continuous, accompanied by shifts in the meanings of established terms—whether through expansion or, at times, reduction [10].

Moreover, as terminological systems evolve, it often becomes necessary to refine and elaborate on the meanings of certain terms by incorporating additional definitions. This ongoing process contributes to the increasing complexity of terminological groups, which may later require simplification to enhance functionality and usability. Notably, in instances where terms are abbreviated to meet practical needs, these shortened forms may later integrate into entirely new terminological frameworks or structures<sup>[11]</sup>.

Thus, in the field of scientific and technical terminology, the lexical composition is constantly updated and replenished, unlike general vocabulary, where there is less urgency for vocabulary development, as most objects and phenomena have long been named.

Many works raise the question of the autonomy of terminological vocabulary: Is it an independent system or an essential part of a common language?

A.V. Superanskaya, in her work General Terminology, argues that terminology constitutes an autonomous section of vocabulary and rejects the notion that terminology is merely an integral component of literary language [7]. She contends that the terms belonging to each branch of knowledge form their own specific terminological systems. The full meaning and significance of each term can be understood only within the framework of its respective system. Consequently, terminology is categorized as specialized vocabulary, forming a substantial part of it, and requires a distinct methodology for its study<sup>[7]</sup>. Conversely, T.V. Nekrasova asserts that the sets of terms established based on concepts, lexical-semantic relations, and their word-formation and grammatical structures are an integral part of general language and inseparable from it. According to her, terminology serves as a broad layer in the lexical composition of the national language and is intricately connected to its fundamental units. She emphasizes that the investigation of terms should occur within the scope of general theoretical and applied linguistics [8]. Nekrasova further claims that terms, as specialized linguistic units, perform their functions only within specific terminological systems; however, outside these systems, terms assimilate into everyday vocabulary. In turn, common vocabulary can also permeate terminological systems through the process of terminology adaptation. These dynamic interactions between terminological and non-terminological lexicons highlight a mutual influence between specialized terminology and common language [8]. From our perspective, T.V. Nekrasova's argument appears more coherent and rational. Any segment of lexical composition ultimately forms an intrinsic part of the broader language system. Her assertion that terms exhibit their unique properties within specific terminological

frameworks but revert to common language when outside those frameworks is supported by numerous examples, such as:

- Field: The main and commonly used meaning is "field; space," while in the terminology of the oil and gas sector, it takes on a specialized meaning of "field."
- Mud: The general meaning is "mud," but in oil production, it specifically refers to "mud (drilling)."
- Head: The common meaning is "head"; in terminology, it refers to the "head" of a tool or construction.

Consequently, it is reasonable to conclude that virtually any terminological system represents a highly dynamic and ever-evolving segment of vocabulary. This is largely due to the fact that the specific field of science or technology associated with such a system is itself continuously undergoing transformation and development. Given this inherent dynamic nature, it becomes essential to emphasize the central element of any terminological system—the term. To advance our understanding further, we must delve into the concept of the term, which we will explore in greater detail in the following section.

## 3.3. Conceptualizations of the Term

Since there is no single definition of the term in linguistic literature, we will consider several perspectives. As noted by F.A. Tsitkina, existing definitions often reveal a noticeable discrepancy between the properties and features of the term as defined and its actual linguistic use; many definitions introduce a kind of ideal term<sup>[12]</sup>.

The concept of a term is frequently explored in contemporary academic discourse as a linguistic unit that encapsulates the essence of specialized knowledge or activity. Detailed definitions of "term" have been articulated by various scholars, emphasizing its significance in professional and scientific contexts. For instance, M.A. Terpak, in his work "Study of the Terminology of a Scientific and Technical Style as One of the Types of Informative Translation," provides an extensive definition: a term encompasses a linguistic unit—whether a word, phrase, abbreviation, symbol, or hybrid construct—that acquires specialized meaning through spontaneous social consensus or intentional agreement within a collective framework [13]. This terminological meaning is expressed verbally or through formalized systems, capturing

the essential characteristics of the corresponding concept at a particular stage of scientific and technological development. Terpak emphasizes that a term must correlate with a specific logical-conceptual unit within a defined content system, anchoring it within its respective domain.

Similarly, A.V. Superanskaya offers a concise yet insightful definition: a term is a specialized linguistic element (word or phrase) used in professional fields under specific conditions. It serves as the linguistic representation of a concept integral to the conceptual system of specialized knowledge, functioning as the primary conceptual unit within the lexicon of languages designed for professional purposes<sup>[7]</sup>.

Taking the definitional stance further, Nekrasova highlights that terms are linguistic constructs specifically tied to a defined system of concepts within an organized subject area<sup>[8]</sup>. According to this perspective, terms possess unique properties such as precision and systematic alignment with the domain they represent, enabling them to convey specialized concepts and denote specific phenomena with clarity and consistency.

From another angle, E.V. Pavlova elaborates on the defining attributes of terms in her work "Specificity of the Transmission of Terms of Various Types." She describes a term as a nominative lexical unit—whether a word or phrase—that bridges sound representation and conceptual objectivity within its designated domain. Pavlova highlights the functional relevance of terms in expressing complex concepts or identifying specific objects within professional systems. Additionally, she identifies key distinguishing features of terms: high informational density, semantic accuracy, systematic interrelations within terminological frameworks, contextual independence, unambiguity, and stylistic neutrality [14].

These definitions collectively underscore the intricate nature of terminology as a cornerstone of specialized communication in professional, scientific, and technical contexts. Through precision in meaning and alignment with structured conceptual systems, terms enable effective transmission of knowledge across specialized domains while fostering clarity and uniformity.

We can say that the shortest working definition is given by F.A. Tsitkina, which can be summarized as follows: the term is "a linguistic sign representing the scientific concept of a special, professional branch of knowledge" [12]. A closer examination of terminology reveals that terms do not always accurately convey a specific concept, nor are they consistently unambiguous or representative of only one idea. They may exist across multiple terminological systems, with some terms comprising more than a single word, while others fail to reflect the defining characteristics of the object they signify within their semantic structure<sup>[15]</sup>. Furthermore, studies indicate that terms often lack clear semantic boundaries and may not consistently express a precisely defined concept<sup>[12]</sup>.

## 3.4. Characteristics of the Term

The definitions provided earlier delineate the main properties or requirements associated with the term. In most academic works, authors often refrain from distinguishing between properties and requirements, opting instead to treat them collectively. Let us examine and analyze these in greater detail. In the Soviet terminological school, D.S. Lotte outlined several key criteria for scientific and technical terms. These include consistency, independence from context (with allowable exceptions), unambiguity (both absolute and relative forms), accuracy, and brevity. Notably, brevity and accuracy often conflict, requiring a compromise when crafting a term, as highlighted by Tsitkina [12], E.V. Pavlova offers another perspective on linguistic features of terms, defining adequacy as the alignment of the term with contemporary scientific understanding of its related concept. Her criteria also mention unambiguity within a defined terminological system, accuracy, brevity, logical semantics, presence of a definition, stylistic neutrality, lack of expressive phrasing, and independence from context (with tolerable exceptions). Consistency remains fundamental in Pavlova's framework [14]. T.V. Nekrasova expands upon these attributes, introducing additional characteristics such as nominativeness, purposefulness, stability, and reproducibility in speech [8]. Moreover, she categorizes term requirements into three groups: semantic, formal, and pragmatic (functional). Semantic characteristics encompass the alignment of a term's meaning with its corresponding concept, exclusion of categorical ambiguity, completeness (where the term encompasses sufficient features for concept identification), and the absence of synonyms. Pragmatic requirements focus on ensuring terms are integrated into professional communication, internationally recognizable (seeking cross-language consistency in form and content), up-to-date (replacing outdated terminology with modern equivalents), and euphonious (easy to pronounce without triggering unfavorable associations)<sup>[8]</sup>. Together, these principles provide a comprehensive foundation for evaluating the effectiveness and suitability of scientific and technical terms.

Based on the studied material, we can conclude that the main properties of the term are consistency, context independence and unambiguity.

Separately, we should consider such a property of the term as consistency. The thesis about the consistency of the term and terminology is recognized as so important that, along with other features, it is often used as the basis for the definition of the term "term". The works of other authors also demonstrate similar ideas. For instance, in the study by V.M. Leychik and S.D. Shelova titled "Linguistic Problems of Terminology and Scientific and Technical Translation," a dedicated chapter addresses the consistency of terminology and terminological systems. The paper highlights that a term can only function meaningfully as part of a terminological system, provided the system is understood as an organized set of terms. This set accurately conveys the conceptual framework of a theory related to a specific domain of human knowledge or activity [16].

When separated from its systemic context, a term loses its defining characteristics. One of the most critical aspects of terms and terminology is their consistency, which necessitates that terminological units be analyzed within the structure of the system to which they belong. As Nekrasova aptly points out<sup>[8]</sup>, the study of such units must remain rooted in the system's framework. Similarly, F.M. Tsitkina emphasizes that the foundation of terminology's systemic nature lies in the systematic relationships of its content. The position of a term within a terminological system directly corresponds to the placement of its associated concept within the concept system pertaining to a specific field of knowledge<sup>[12]</sup>.

It should also be noted that consistency can be meaningful or linguistic. As a member of the term system, the term has a sign of content systemicity, in other words, in its meaning, the term is closely related to all other members of the term system—as a designation of a species concept in relation to a generic one, as a designation of the result of an action in relation to an action, etc. Often the meaningful consistency is meant by "consistency". The dependence of a term on a system of concepts is also manifested in a spe-

cial paradigmatics, in a specific nature of compatibility with other terms within each term system. Here we can already talk about the linguistic systemic nature of the term [12].

One of the key characteristics of terminology that has garnered significant attention is its unambiguity and independence from context. These two aspects are frequently discussed together due to their close interrelation. Ch.V. Erdineyeva<sup>[17]</sup> emphasizes that terms should possess both qualities, ensuring that every concept is represented by a single term, thereby avoiding the occurrence of synonymous terms, although they still appear on occasion. Terms are designed to precisely identify real-world objects and phenomena, facilitating a clear and unequivocal comprehension of information.

### 3.5. Features of Translation of Terms

Translating scientific and technical texts requires particular focus on terminology, as these terms convey the core content, provide structure, and encode specialized information. Consequently, achieving the highest level of equivalence when translating terms becomes a critical challenge, as highlighted by Bazalina [18]. Similarly, E.V. Kaminskaya emphasizes that terms in scientific and technical literature appear frequently and hold significant semantic value. Moreover, like regular words, terms can sometimes have multiple meanings, making careful consideration of context essential during translation efforts [19].

We find confirmation that one of the main difficulties in translating a term is its polysemy. Polysemy is understood as the possibility that one term can belong to different terminological systems, in accordance with this changing its meaning [18].

E.N. Basalina emphasizes that the unique challenge of translating terms lies in maintaining the content accuracy of the original language's units, ensuring conceptual identity between the source and target languages. Achieving equivalence in translation hinges on aligning the concepts expressed by terms across both linguistic systems. Essentially, if the terms in both languages encode concepts relevant to a specific scientific domain, then ensuring the identity of these encoded concepts becomes the translator's primary objective when working on specialized texts. Addressing discrepancies in how concepts are represented within the terminological systems of the source and target languages

is crucial for achieving interlanguage harmony, which ultimately facilitates effective term translation. In cases where semantic differences need to be highlighted during translation, additional linguistic tools, such as explanatory comments, can be employed to clarify<sup>[18]</sup>. When discussing semantic disparities between two languages, it is notable that terminological translation serves not only as a medium for sharing scientific knowledge but also as an integral aspect of linguocultural communication. The translator acts as a mediator, bridging the scientific and cultural heritage of different nations. A profound understanding of both linguocultural and sociocultural elements of the source language is essential for producing translations with high accuracy and impact<sup>[20]</sup>. The discrepancies in concept volumes observed in English-Russian terminology reflect broader cultural and cognitive dissonances in capturing events, phenomena, and states. Such inconsistencies could rightly be categorized as systemic dissonance<sup>[21]</sup>. V. Grinev-Grinevich, in his work "On the Terminological Aspects of Scientific and Technical Translation," identifies two primary scenarios encountered during term translation: first, when equivalent terms exist in the target language and are documented in dictionaries; and second, when no equivalents can be found [22]. Furthermore, he classifies terms based on their complexity in comprehension and translation into three distinct groups: (a) terms describing foreign realities that align with domestic realities; (b) terms describing foreign realities without corresponding domestic analogues but with widely accepted terminological equivalents; and (c) terms describing foreign realities lacking both domestic analogues and standardized terminological equivalents [22].

The situation when there are unambiguous and officially fixed equivalents of the translation unit in the target language, obviously, does not cause certain problems in translation. Whereas in the second situation, due to the lack of a generally accepted equivalent, certain difficulties arise. Yu.G. Stitches, we also meet the very decoding of such a concept as "temporarily non-equivalent term". The lack of equivalence is a consequence of the reflection of the national characteristics of individual language levels. SOUTH. Stezhko gives the following definition of non-equivalent vocabulary: "Non-equivalent vocabulary is lexical units that reflect an ethnically specific characteristic of objective reality at the conceptual and linguistic levels" [20].

The method of solving the problem of non-equivalence can be called the process of synonymization. Synonymization is understood as the selection and analysis of synonyms as a certain way of developing synonyms for industry terms, which makes it possible to improve the practice of professionally oriented translation. This method makes it possible to more accurately correlate terms and their combinations of certain fields of activity or branches of knowledge [21].

According to S.V. Vlasenko, adequate translation of industry terminology is associated with understanding and de-objectification of its semantic content in the source language and meaning in the translating language [21]. And we cannot but agree that the basic skill of a translator actsIt essentially consists in the correct assignment of verbal meanings to units of the terminological system or to other units of the text, disobjectified and assimilated in the course of their active perception in the process of translation. In order to develop this fundamental skill, synonymization is also important.

The synonymization method consists in building a plural number of translation options, taking into account the identified translation precedents or correcting them by building a list of their interpretation options. Thus, we can say that the process of synonymization is based on the procedure of "inventorying" examples of translation of a given term, which should be considered as translation precedents (or as cases of translation practice), to some extent indicative from the point of view of the translator [21].

V.M. Leychik identifies three fundamental criteria necessary for achieving an appropriate translation of specialized terminology. Firstly, the translation of individual terms within the text must be accurate and contextually appropriate. Secondly, each term should be analyzed in relation to its respective terminological system, both in the source language and the target language, ensuring its alignment with linguistic and disciplinary conventions. Lastly, variations in term usage arising from the unique characteristics of each language must be carefully considered and integrated into the translation process. Leychik's framework underscores the importance of systematic evaluation to maintain terminological precision [16].

When fulfilling each of the conditions, the translator encounters certain difficulties. The volume of meaning of a term in the original language may not coincide with the volume of meaning of the same term in the target language, which can make it difficult to provide an adequate translation. A situation may also arise when the target language lacks an equivalent to the term of the source language (this case has already been described above)<sup>[16]</sup>.

The fulfillment of the second condition necessitates an analysis involving comparisons between the term in question and the structure of a specific terminological system. If a term system has been formally established and matured in both the source and target languages, the translated term should integrate seamlessly into the terminological framework of the target language. However, it is essential to acknowledge that satisfying this condition may not always be feasible. This limitation stems primarily from the fact that identical fields of knowledge can be organized through distinct terminological systems, each constructed on disparate conceptual foundations and interpretations, as noted by Leychik [16].

The third condition for achieving an adequate translation emphasizes the importance of considering the "worldview" shaped uniquely by each language [23]. This particular linguistic worldview often calls for adaptive strategies during translation processes. Facing such challenges may warrant the employment of descriptive constructions or supplementary explanations, such as translator comments, as further discussed by Leychik<sup>[16]</sup>. Instances of using explanatory comments to address semantic divergences have also been observed in E.N. Basalina's work. In summary, aligning with V.M. Leychik, it can be asserted that careful attention to these three conditions—evaluating terminological congruence, integrating into the target language's conceptual system, and accommodating linguistic worldviews-remains fundamental when selecting appropriate translations for specialized terms.

E.V. Pavlova notes the need to use several dictionaries and reference materials, analyze cases of compatibility of a 5. certain term and take into account the context in translation, since, despite the initial striving of any term for unambiguity, there are often cases of ambiguity even within a narrow context<sup>[14]</sup>. Among the most frequent methods of translation of terminological neoplasms, E.V. Pavlova notes the following: 6. tracing, transliteration, functional replacement, as well as their combinations<sup>[14]</sup>.

Regardless of the skill level of the translator and the 7.

situation, terms in some cases may still be translated inaccurately. S.V. Grinev-Grinevich believes that there are three main reasons for inaccurate translation of terminology:

- A. The development of scientific thought (the case when for a new concept there is still no corresponding term, and for its name at first the nearest or similar term is used); this is the reason for the emergence of the term's ambiguity, which in most cases is removed with the development of the concept;
- B. Stylistic goals (the translator may resort to using synonyms of the term or its short textual variants in order to avoid unnecessary monotony of the text and multiple repetitions);
- C. Simple carelessness or incompetence of the translator<sup>[12]</sup>.

V. Grinev-Grinevich gives very useful generalized recommendations for the translation of terms, developed at the All-Union Translation Center. The recommendations are as follows:

- 1. The translation preferably uses the terms established by the relevant state standards;
- 2. It is necessary to take into account which field of science or technology the term being translated belongs to (correlation of the term with the terminology system);
- 3. In the event of a collision with a term that is not recorded in scientific and technical dictionaries, the translator must choose a translation equivalent himself, using reference literature, resorting to consultation with a specialist in this field, or use a descriptive translation;
- 4. In the text of the translation, it is advisable to avoid the synonymous use of terminological units (we have already mentioned above that the use of synonyms of the same term in order to avoid monotony can lead to inaccuracy of translation);
- If a semantic error related to the spelling of a term is found in the original text, the translator is obliged to provide a translation corresponding to the original, and indicate the error in a footnote and provide the correct version;
- Terms foreign to the translated language remain in the translation in the original language, while the translation is written in brackets;
- 7. Terms in Latin are not translated and are kept in their

original form;

- 8. Arbitrary abbreviation of terms is not allowed (another possible reason for inaccuracy in translation of terms);
- 9. Nomenclatures should be kept in their original spelling;
- 10. Units of physical quantities, special signs must correspond<sup>[12]</sup>.

# 4. Results and Discussion

# **Basic Techniques of Translating Oil and Gas Terms**

As with all terminological systems, the terminology related to the oil and gas sector employs compound terms that can consist of one, two, three, or even more components (some sources refer to these as simple and complex terms). In the terminological system of the oil and gas industry, it is evident that there is a significant prevalence of single-component terms [21].

The study of the equivalents of terminology in the oil and gas sector across English, Russian, and Uzbek languages, as well as the examination of their translation occurrences in various sources, has yielded the following findings.

Firstly, for the translation of one-component English terms, the internal resources of the Uzbek language have been utilized. Specifically, efforts have been made to identify words within the Uzbek lexicon that correspond to certain one-component terms in the oil and gas domain. For instance, the term "pipeline" translates to "quvur," "well" to "quduq," "aggregate" to "uskuna," and "fuel" to "yoqilg'i", "pressure" to "bosim", "fluid" to "suyuqlik", "drilling" to "burg'ulash", "safety" to "xavfsizlik", "system" to "tizim", "exploration " to "tadqiqot."

The aforementioned adequate terms have been selected based on the semantic range of Uzbek words, drawing upon their metaphorical meanings, thereby ensuring that they correspond closely in meaning to the original English terms. For a significant portion of one-component oil and gas terms, the use of Russian equivalents has been preferred for adequate translation. This approach has been adopted in instances where the internal resources of the Uzbek language were deemed insufficient for achieving an adequate translation [24]. For example, "oil" translates to "нефть" in Russian, "neft" in Uzbek, "gas" to "газ" in Russian, "gaz" in Uzbek, "isomerizate" to "изомеризат" in Russian, "izomerizat" in Uzbek,

"oxygen" to "кислород" in Russian, "kislorod" in Uzbek, "hydrocarbon" to "углеводород" in Russian, "uglevodorod" in Uzbek, "tar" to "смола" in Russian, "smola" in Uzbek, "gasoline" to "бензин" in Russian, "benzin" in Uzbek, "rubber" to "каучук" in Russian, "kauchuk" in Uzbek, "butane" to "бутан" in Russian, "butan" in Uzbek, "propane" to "пропан" in Russian, "propan" in Uzbek, and "asphalt" to "асфальт" in Russian, "asfalt" in Uzbek, "hydrogen " to "vodorod" in Russian, "vodorod" in Uzbek. As evidenced by the examples provided, the majority of one-component English terms related to oil and gas in the Uzbek language have been borrowed through the Russian language. The translation of these terms has been carried out through the process of transliteration. This analysis underscores the complexities involved in the translation of specialized terminology within the oil and gas sector, highlighting the interplay between language resources and the need for precision in conveying technical meanings across languages.

The collected materials indicate that terms composed of two components are particularly numerous within the terminological system of the oil and gas sector. For example: hydrocarbon mixture – uglevodorod aralashmasi, gasoline blend – benzin aralashmasi, crude oil – xom neft, natural gas – tabiiy gaz, enhanced oil recovery – neftni qayta ishlashning yaxshilanganligi.

In the translation of two-component oil and gas terms from English, both Uzbek and Russian languages have been utilized effectively. When equivalent terms exist in Uzbek, the corresponding Uzbek words are employed. Conversely, in cases where no equivalent is found, the Russian equivalent is used. Furthermore, the translation of two-component and multi-component oil and gas terms is based on the grammatical rules of the Uzbek language.

Due to the distinct linguistic families of Uzbek and Russian, there are significant differences in the structure of phrases and word combinations. In this context, the translations of multi-component English terms into Uzbek demonstrate that they have been translated using a calque method involving both Uzbek and Russian words. For instance, the following English terms have been translated into Uzbek using a semi-calque approach based on Uzbek grammatical conventions:

- high-octane additive yuqori oktantli qoʻshimcha
- heavy gasoline og'ir benzin

- liquid bitumen suyuq bitum
- light distillate ochiq rangli distillyat
- liquefied gas suyultirilgan gaz

In these translations, the first component functions as an adjective or descriptive term, while the second component serves as a noun. These two components are combined through a method of juxtaposition, without any grammatical affixes.

Additionally, the following English terms have been translated into Uzbek using a modification approach that incorporates both Uzbek and Russian words. In these instances, possessive suffixes have been added to the second component:

- construction bitumen qurilish bitumi
- petroleum jelly neft jeli
- diesel fuel dizel yoqilg'isi
- aqueous phase suv fazasi

In the examples provided, the suffixes -i and -si denote the possessive case in the singular form, indicating ownership or relation.

In the translation of oil and gas terminology in English, Russian sources often serve as the primary reference for Uzbek language<sup>[25]</sup>. Consequently, disputes sometimes arise among scholars regarding whether to retain the Russian form of certain terms or to express them with new Uzbek terminology. However, in many instances, retaining the Russian form of a term is preferred to avoid misunderstandings (for example, oil – qora oltin (in Uzbek), черное золото (in Russian), key – (in Uzbek), ключ (in Russian)).

Compound terms consisting of three or more components arise from the combination of several elements: highpressure gas pipeline – yugori bosimli gaz guvuri, oilfield development plan – neft konlarini rivojlantirish rejasi, offshore drilling platform – dengizda burg' ulash platformasi, environmental impact assessment – atrof-muhitga ta'sirni baholash.

The presence of multi-component terms can complicate the process of information exchange. It is important to note that the abundance of one- and two-component compound terms is distinguished not only by their quantity but also by the diversity of the methods and tools used for the interconnection of components [26].

the terminology we studied was translated using methods such as transliteration, transcription, and calque translation. Approximately 15% of the terms were rendered through these translation techniques. These methods were primarily employed when translating single-component and twocomponent terms. In contemporary translation practice, the predominant approach involves transcription while retaining certain elements of transliteration. Given the significant differences between the phonetic and graphic systems of various languages, the representation of a foreign word's form in the target language is always somewhat conditional and approximate. For example, "generator" is rendered as "generator," and "transformer" becomes "transformator."

Calque translation is a method whereby a lexical unit from the original text is translated by replacing its constituent parts—morphemes or words (in the case of fixed expressions)—with their lexical equivalents in the target language<sup>[27]</sup>. The essence of calque translation lies in the creation of a new word or fixed expression in the target language that mirrors the structure of the original lexical unit. Examples of terminology translated through calque methods include: "data pipeline" as "ma' lumotlar quvuri," "software architecture" as "dasturiv ta' minot arxitekturasi," and "safety protocol" as "xavfsizlik protokoli."

Many of the terminological units have established equivalents in the Uzbek language, which are officially recognized in Russian-Uzbek dictionaries. Approximately 65% of the units in the materials used fall into this category. Officially recognized equivalents include terms such as "casing" as "obsadka," "hydraulic fracturing" as "gidravlik fraktura," "production well" as "ishlab chiqarish qudugi," "exploration drilling" as "qidiruv burg' ulash," and "pressure gauge" as "bosim o' lchagich."

Descriptive translation methods accounted for about 25% of the terms translated. Examples of such translations include: "workover" as "quduqni qayta ta' mirlash," "well interventions" as "quduqqa aralashuvlar," "reservoir characterization" as "katlam xususiyatlarini aniqlash," "pipeline integrity management system" as "quvur liniyasi mustahkamligini boshqarish tizimi," and "high viscosity fluid" as "yuqori viskoziteli suyuqlik."

In the domain of the oil and gas sector, the Uzbek language employs a sophisticated system of terminology that It is important to note that the smallest proportion of relies on identifying components, which are also integral

to various other terminological frameworks. A notable distinction within this context is the varying productivity of quality-forming affixes utilized in the construction of terms; while some affixes demonstrate substantial productivity, others exhibit comparatively limited efficacy. The identifying components that constitute such compound terms are primarily derived from the following quality-forming affixes:

#### 1) -simon Affix

The -simon affix, as delineated in "Uzbek Language Grammar," is categorized under the label "passive (less productive)." However, both empirical terminological studies and our own research substantiate the assertion that the simon affix remains one of the more active and productive affixes in contemporary usage. Its significant prevalence across diverse fields—including zoology, botany, biology, medicine, technology, physics, and chemistry—further underscores its relevance. Within the specific terminology of the oil and gas sector, several terms have been generated using this affix. Illustrative examples include:

gaseous substance- gazsimon modda coal-like substances - ko'mirsimon moddalar purification object - tozalash ob'ekti coal-like stone - ko'mirsimon tosh

It is widely recognized that the principle of similarity has historically served as a fundamental method for the formation of compounds in languages, including Uzbek literary language. This principle is realized through the utilization of various affixes such as -day (-dey), -namo, in conjunction with words like kabi, singari, and o' xshash. The -simon affix is a prominent example of this phenomenon. Notably, characteristics such as ease of use, phonetic clarity, and the capacity to convey precise meanings have established this affix as a significant element not only within literary discourse but also across multiple terminological systems.

#### 2) -li Affix

The -li affix, present in the structure of compound terms, conveys meanings associated with "possession" and "existence." Examples of compound terms that incorporate this identifying component include:

Mercury-containing device - simobli uskuna Gas source – gazli manba Porous coal – g'ovakli ko'mir Capacity concrete – sigʻimli biton-gi (-ki, -qi) Affix ary contexts, signifying relationships pertaining to time and place. Within the terminology specific to the oil and gas sector, this affix is exclusively employed to denote location. For instance:

Internal and surface layers of the earth – Yerning ichki va ustki gatlami

Internal molecular structure of substances - moddalarning ichki molekular koʻrinishi

#### 3) -aro Affix

vchanlik

The -aro affix facilitates the creation of the following identifying compounds:

Inter-substance exchange - moddalararo almashinuv Intercellular substances – hujayralararo modda Inter-system conductivity - sistemalararo o'tkazu-

Inter-system transition – tizimlararo o'tish

#### 4) -iy and -viy Affixes

In the terminology of the oil and gas sector, compound terms formed with the identifying components -iy and -viv are also frequently encountered. Examples include:

Modern equipment – zamonaviy asbop-uskunalar Permanent control - doimiy nazorat Cellular growth – hujayraviy o'sish

Material exchange - moddaviy almashishConclusion

In summary, it is imperative to recognize that simple compound terms not only represent a substantial portion of the terminology system within the oil and gas sector but also confer distinct advantages by articulating sector-specific concepts with precision, clarity, and conciseness. This linguistic efficiency enhances the clarity of information and facilitates effective communication and exchange of ideas within the field.

We did not find instances of multi-component terms that were entirely translated using lexical transformations such as transcription or transliteration. However, we established their significance in terms of the economy of linguistic signs when translating individual components. For example, "relict gas hydrates decomposition" translates to "relikt gaz gidratlari parchalash," where the three components—relict, gas, hydrates-illustrate transliteration. It is important to emphasize that to maintain the purity and distinctiveness of the Uzbek language, it is advisable to use transcription and transliteration sparingly. For instance, the multi-component This affix predominantly attaches to nouns in liter-terms "offshore engineering structures" translate to "dengiz muhandislik strukturalari," "phase equilibrium change" translates to "fazaviy ekvilibrium o' zgarishi," and "well support destabilization" translates to "qo' llab-quvvatlash barqarorligi destabilizatsiyasi." These examples reflect a conscious decision to avoid potential transliteration or transcription, such as using "structures" as "strukturalar," "equilibrium" as "ekvilibrium," and "destabilization" as "destabilizatsiya."

Certainly, there are instances where the translator must decide which transformation is appropriate in a given context—whether to employ transliteration/transcription, an Uzbek equivalent, or a descriptive translation. The combination of two transformations—transliteration/transcription and explication—occurs less frequently when conveying a term. For example, "klystron" translates to "klistron," an electronic device based on the principle of grouping electrons by speed according to internal and external modulation. This linguistic phenomenon is referred to as parallel connection.

Speech compression is achieved through calque translation in cases where the translation of two English words is rendered as a single two-root Uzbek component with an affix. Examples include "gas condensate field" as "gaz kondensatli kon," "hydrate-saturated rocks" as "gidratga to' yingan jinslar," "intense gas ingress" as "kuchli gaz kirishi," and "marine electrical exploration" as "dengiz elektrik qidiruvi."

Multi-component terminological combinations are conveyed using various prepositions. For instance, "wireline blowout preventer" translates to "kanatli ishlarda qarshi chiqish oldini olish uskunasi," where "blowout preventer" becomes "qarshi chiqish oldini olish uskunasi," and the term "blowout" undergoes a change from a noun to an adjective, with the prefix "qarshi" added to the base in relation to the combinatory value of the core "preventer." The question of purpose (for what?) is posed to the resulting phrase: "...for wireline operations."

Similarly, "permafrost thaw aureole radius" translates to "doimiy muzliklarda erishning orol radiusi," where the question of location (in what?) is directed at "permafrost" (doimiy muzlik), with the translator also incorporating the lexical addition "in zones" to express the implied component.

Multi-component terms translated through explication include "industrial safety technologies" as "sanoat xavfsizligini ta' minlovchi texnik yechimlar" and "concrete gravity-based platform" as "beton asosida g' ovakli platforma." The

translation of this term illustrates that explication is a complex lexical-grammatical transformation, involving calque and part-of-speech substitution in "gravity" as "g' ovakli," calque in "platform" as "platforma," and even the addition of the preposition "on" and the use of the genitive case (asosida).

In the term "reactive power compensation," "reactive power" is an attribute, while "compensation" is the main component. The only correct translation is "reaktiv kuchni kompensatsiya qilish," not "kuchli reaktivlarni kompensatsiya qilish." An analogous example is "high density drilling mud," where "drilling mud" is the main, indivisible component translated first, and "high density" serves as an attribute. The equivalent and adequate translation is "yuqori zichlikdagi burg' ulash suyuqligi," not "burg' ulash yuqori zichlikdagi suyuqlik."

Thus, when translating English multi-component terms in the oil and gas sector, the translator aims to accurately recreate a morphological-syntactical equivalent in the target language, employing a range of translational transformations. Structural-semantic analysis of terminological combinations reveals the patterns of relationships among components that are in subordinate syntactic connection, thereby determining the translator's tactical actions when working with multi-component terms.

The predominant methods of translation (calque, use of the genitive case) are accompanied by additional translational techniques such as rearrangement, specification, part-of-speech substitution, omission/addition. When translating multi-component terms, it is crucial to adhere to the pragmatic orientation of scientific and technical texts, focusing on the specialist audience, and to conduct the translation after thoroughly studying reliable technical literature, bilingual texts, and relevant diagrams and schematics.

# 5. Conclusions

Terminology, as a collection of terms used within a specific field of knowledge, is a key aspect of study in terminology science. It constitutes an integral part of the domains of science and technology. The primary focus of terminology studies is the collection and inventory of terms, which can subsequently be organized into terminological systems. A terminological system is an ordered set of terms with established relationships between them, reflecting the

relationships among the concepts that these terms denote. This system is a constantly evolving, dynamic component of language.

Various definitions of a term exist, some of which encompass its properties and the requirements imposed on it. The term can most succinctly be defined as a unit of language that denotes a concept within a specific field of knowledge or activity. A term may consist of a single word or a phrase that most effectively encapsulates the described concept. The fundamental properties of a term include unambiguity or contextual independence, systematicity, precision, and informativeness.

Unlike any other type of translation, technical translation consistently strives for the highest possible accuracy and completeness in conveying the information embedded in the original text. Any error can lead to serious consequences and result in a fundamentally incorrect understanding of the information. Since terms form the foundation of technical texts, they require particular attention.

Terminology represents a distinct lexical category that, despite the demands for unambiguity, precision, systematicity, and independence from context, remains a highly dynamic and actively evolving part of language. This dynamism underscores the necessity for active study of technical translation, particularly the nuances involved in translating terminological vocabulary. The terminology of the oil and gas industry appears to be one of the most pertinent topics for research, as the oil and gas extraction and processing sector is among the most critical areas in both the Russian and global economies, with active international collaboration in this field.

In the course of addressing the outlined objectives, it was found that terminology constitutes a separate lexical category, with the term being a key aspect of this category. In the majority of the studies we examined, a term is defined as a unit of language used to denote specific concepts and phenomena. We also identified the primary properties of a term, such as systematicity, unambiguity, contextual independence, lack of emotional connotation, and informativeness.

Additionally, we explored the methods of translating oil and gas-related terms, among which the most commonly used include the method of seeking absolute equivalents, descriptive translation, calquing, and transcription. Furthermore, it is essential to consider the specifics of the target language and its semantic characteristics. When faced with situations where there is no officially established equivalent in the target language, the translator may refer to reference materials, study translation precedents in the field, and employ descriptive translation methods.

Through the analysis of terminological units, it was determined that the majority of terms have established equivalents in the target language (in our case, the Uzbek language). Other methods for translating terminological units include descriptive translation, calquing, and transcription.

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Conceptualization, Z.K.; methodology, Z.K.; Software, Z.K.; validation, Z.K. and N.P.; formal analysis, Z.K.; investigation, Z.K. and N.P.; resources, Z.K. and N.P.; data curation, Z.K. and N.P.; writing—original draft preparation, Z.K. and N.P.; writing—review and editing, Z.K.; visualization, Z.K. and N.P.; supervision, Z.K. and N.P.; project administration, Z.K.; funding acquisition, Z.K. All authors have read and agreed to the published version of the manuscript.

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### Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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