



# Research on Terminological Variation in Petroleum Scientific and Technical Translation

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## Abstract

Terminological variation is an inevitable phenomenon in petroleum scientific and technical translation. The phenomenon of terminological variation makes translation difficulties for translators. For some Sino-foreign joint venture oil and gas projects, the use of non-standard terms by translators will not only reduce the communication efficiency between Chinese and foreign personnel, but also threaten the safety of oil production due to misunderstanding. This paper collects and classifies the terms of an oil project, and the research result shows that the concept variation of terminology is the main reason for the formation of terminology variants in petroleum science and technology. Translators are not helpless in the face of these variants. Mastering the causes and differences of terminology, improving translators' professional abilities, establishing memory databases and terminology databases, improving terminology retrieval capabilities, and combining with other countermeasures can improve the efficiency and accuracy of translation.

## Subject Areas

Translation

## Keywords

Petroleum Scientific and Technical Translation, Terminology Variants, Translator's Countermeasures

## 1. Introduction

Terminology, also known as technical terms, is collections of appellations used to represent concepts in a particular subject area. Terms can be words or phrases, which are used to correctly express things, phenomena, characteristics, relationships, states and processes in the field of science and technology and social

sciences, and are special marks that reflect the progress of science and technology and social sciences (Fang M. Z., 2013) [1]. The Dictionary of Linguistics and Linguistic Sciences defines “variant” as a language spoken at a particular time, place, and group, and when it is distinguished from other languages by time, place, and group of people (DUBOIS, 1994) [2]. For example, “kick” generally means “to hit someone or something with foot”, but in football sports, it means “shoot”, in some Western slang, it means “refuse”, “dismissal”, “banter”, “six-pence”, etc. and in the field of petroleum technology it conveys too much pressure in the downhole, mud gushing out, which may cause a blowout. Term variation is an objective phenomenon in scientific texts. This paper analyzes the translation pitfalls caused by terminology variations in petroleum technology translation based on translation examples, and puts forward the countermeasures of translators.

## 2. Terminological Variants Exist Reasons

Terminology variant is a phenomenon of variation in the use of language, which can produce variation due to differences in disciplines, discourses, styles, time, space and other factors. The author classified nearly 2000 petroleum terms of a Sino-foreign joint venture oil project, and found that nearly 15% of the terms have variants.

### 2.1. Analyze from an Interdisciplinary Perspective

With the continuous development of science and technology, various fields and disciplines are integrated with each other, which makes it possible for a term to appear in different subject areas at the same time. If a translator can't accurately determine the subject area to which the term belongs, they are likely to fall into the translation trap. For example, “allowance” and “deposit” have different meanings in the field of finance and in the field of petroleum engineering; “stroke” has different meanings in the field of literature, in the field of medicine and in the field of petroleum engineering, and “cure” has different meanings in the field of medicine and in the field of petroleum engineering. Ambiguous terms can also be expressed as multiple domains sharing the same word form (Leng B. B., 2021) [3].

### 2.2. Analyze from Synonym or Polysemy Perspective

In terms of variant forms, there are synonymous terms or polysemy terms, and the author believes that the variation of terms not only refers to the change in the expression form of terms, but also refers to the differences in the concept of terms, that is, there probably be several different concepts in a same term.

#### 2.2.1. Synonymous Terms

One same concept has different references, e.g. “coalbed methane” and “coal bed gas”, “field produced water”, “gas field water” and “gas field wastewater”, “steam purge” and “steam blow”, “associated gas” and “accompanying gas”, “connate

water” and “fossil water”; and as a translator, it is necessary to fully grasp the situation that there are synonyms in both the source language and the target language in order to make the translation have a high degree of accuracy.

### **2.2.2. Polysemous Terms**

One term form expresses multiple concepts, such as the word “pipe”, which can be translated as pipe, tube, pipeline, hose, but they are fundamentally different, pipe is classified as a tubular container, usually used to transport gases or liquids, in general use, tube and pipe are usually interchangeable, but in industry and engineering, these terms are uniquely defined according to the applicable standards on which they are manufactured. Generally speaking, “pipe” is the most commonly used term in the world, while “tube” is more widely used in the United States. Hose refers flexible pipe, and pipeline refers to a pipeline connected by a series of pipes. Another example is the pressure relief valve, which can be translated as blowdown valve or relief valve, but blowdown valve generally refers to pollution discharge, which can be manually controlled. Relief valve can also be translated as decompression valve, pressure relief valve, with a preset pressure, can be automatically opened to keep the pressure within the preset range, also known as “safety valve”, because it is generally used in overpressure and emergency situations, and cannot be controlled manually. When translating polysemous terms, translators should choose the correct meaning according to the context to avoid ambiguity or error.

### **2.3. Analyze from Common Words Terminologization**

In petroleum technical translations, the phenomenon of terminologization of common words is also usual. Such as capacity, formation, cover, cylinder, disc, disc displacement pig, drill string, degreasing agent, fall arrest system, fault, flow fraction, globe valve, inclusion, kill & chock line, liner, migration, misalignment, packing, seat, section, spacer, suction head, trap, trip, uncased, riser, free sulfur, etc. It is found that term variation not only refers to the different morphological changes of terms, but also refers to the conceptual changes of terms. Conceptual variation and formal variation of terms are both phenomena of terminology variation, and they are ubiquitous in Chinese, English, and other languages.

### **2.4. Analyze from a Metaphorical Perspective**

In addition to synonymous substitution and ways of establishing equivalence between different terms, experts also use rhetorical means, such as metaphors, to express the concept of terms. For example: Christmas tree (a device for controlling the flow of oil or gas wells), body, Cup Pig, filter cake, fugitive dust, fugitive emission, swing check valve, wind-sock, etc. The terms are concise, and most of them are professional and interesting at the same time.

In summary, the common use of disciplines, the existence of synonyms and polysemous terms, the terminologization of common words and the use of metaphors are the reasons for the existence of variants of petroleum terms. When

translating petroleum science and technology texts, translators should maintain a high sensitivity to these phenomena to avoid mistranslation. The following are some countermeasures of translators.

### **3. Translation Countermeasures of Petroleum Technical Terms**

In the English translation of petroleum science and technology, the correct translation of terms is directly related to the success or failure of the target text, and in the translation process, the terms must be translated into the language of the petroleum industry, which fully reflects the characteristics and professionalism of the field.

#### **3.1. Improve the Professional Ability of Translators**

In order to be successful in the field of petroleum science and technology translation, translators not only need to have an in-depth understanding of the petroleum industry, but also need to maintain sensitivity to terms, not only to ensure that the target texts are accurate and rigorous, but also to be logical in language. In petroleum translation services, it is necessary to be forward-looking, keep pace with the times, constantly accumulate translation experience, and improve translation capabilities. In an information era, with the rapid development of translation technology, a professional translator must master computer-assisted translation (CAT) technics, such as the use of translation assistance software SDL Trados, Yi CAT, MemoQ, transmate, etc., these translation software will integrate translation editing functions, translation memory and terminology database and other functions into one system, so that translators can switch freely, which can greatly improve the efficiency and quality of translation work.

#### **3.2. Establish Translation Memory**

Translation memory is one of the core technologies of computer-aided translation and an important part of the translator's workstation (Qian D. X., 2011) [4]. Bowker (2002: 93) [5] defines a translation memory as a language database used to store the source text and its target text. Translation memories keep track of all the original texts and corresponding target texts that have been translated by the translator since the beginning of the memory, and the use of translation memories ensures consistency in the common definitions, grammar, expressions, and terms of petroleum science and technology texts, especially when multiple translators are translating one text at the same time. There are many professional terms in petroleum science and technology texts, and translators can collect relevant parallel texts before translation and import them into the translation memory, so that translators needn't spend plenty of time to memorize a large number of petroleum terms, so they can focus more on improving the quality of target texts, and the translation efficiency will be greatly improved. Translators can select and decide on parallel texts by extracting the terms in the original text,

and according to the frequency and repetition of the terms to choose parallel texts.

### 3.3. Establish Terminology Base

Petroleum is a comprehensive discipline that spans many fields such as chemical engineering, geology, machinery, physics, mathematics, and computer science, and its terminology is also all-encompassing. Terminology management is an important part of the modern translator's competence system. Translators can build an electronic terminology database about the oil field to improve the efficiency of translation and ensure the accuracy and professionalism of translation. In the case of Trados, if translators have existing terms, they can make an Excel glossary, convert it through SDL MultiTerm Convert, create a termbase, and import the converted terms into the Trados termbase for use to ensure consistency. If there are no present terms, translators can collect oil-related texts in English and Chinese in the termbase, align the original text with the target text by Tmxmall, extract the terms and export it to Excel, and then convert it with MultiTerm and import into the Trados term database.

### 3.4. Improve Retrieval Capabilities

#### 3.4.1. Search Engine Retrieval

Translators can use major authoritative dictionaries, such as Oxford Online Dictionary, Bing Dictionary, Google Dictionary, Linguee, etc., to verify the terms, so that translators can choose words more accurately, more commonly used and more standard in the process of translation. Log in CNKI, select "Dictionary" in the "Knowledge Element Search" entry, and enter the term to be verified for online verification, so as to improve the accuracy and avoid the trap of terminology mistranslation. But sometimes only relying on the dictionary cannot verify some terms, then it is necessary to use the search engine to search for the term, take the oil term "Pigging" as an example, enter pigging on the Oxford Online Dictionary to show "to eat too much of something", which obviously has little to do with the explanation of oil terms, continue to enter the term in the Bing dictionary, and the network definition appears "scraping; pigging; pigging operation" But there is no detailed explanation, and there is no oil-related explanation in the Google dictionary, so it can be further verified on search engines such as Google, Bing search, Wikipedia, etc., and you can search for "Pipeline Pigging Definition/Meaning Pipeline pigging refers to the use of pigging equipment/machines more specifically Pipeline Integrity Gauges or 'PIGs' for the routine cleaning, maintenance, and inspection of pipelines." Pipe pigging definition: Pipe pigging refers to the use of pigging equipment, more specifically a pipeline detector, to carry out daily cleaning, maintenance and inspection of pipelines, usually written as "PIGs". If translators want to know the explanation of "Pipeline Integrity Gauges", they can further search for "A pipeline inspection gauge, commonly referred to as a pig, is a device used to clean and inspect pipeline." It can also be seen that "PIG" also means "pipeline inspection gauge" or "pipeline

inspection gadget”, and what is “Pig launchers”, what is “Pig receiver”. On Baidu, it can also be learned that the “pig” squeaks when colliding with the pipeline when pigging, and it is associated with the name “pig”, like the scream of a pig. Therefore, oil workers who have been working in the field for a long time joke that “PIGs” are “pigs”, and Bing and Wikipedia can also verify them at the same time, and translators can also compare and integrate information. In addition, the use of Google advanced search function, translators can also search for abbreviations, pictures, “words to be checked” + keyword searches, etc., the use of search engines to retrieve terms is not only very convenient and effective, but also can get some fun in the scientific research process.

#### **3.4.2. Termbase Retrieval**

Online verification of terms can be carried out through authoritative term knowledge service platforms, such as Termonline, UNterm, World Health Organization term database, etc., taking Termonline as an example, entering “globe valve”, three translations and the corresponding publication year will be retrieved, and Taiwan, China is usually translated as “ball valve”, so as to understand the synchronic variants of the term, and can also retrieve the subject category to which the term belongs, related literature, etc. The UNterm is a multilingual term database, providing six official languages, including Chinese, English, French, Spanish, Russian, Arabic, etc., for example, enter “cracking”, translators can retrieve the Chinese meaning and can also view the translation and definition of the term in various languages, input Chinese terms can also retrieve the translation of various languages, if translators need to translate in multiple languages, the terminology database is a better choice. Terminology database search not only allows translators to avoid terminology misunderstanding errors and help translators complete complex technical translations, but also helps translators quickly search or update terminology to ensure the uniformity of terms in the translation, thereby improving the quality of the translation.

#### **3.4.3. Corpus Retrieval**

The corpus can also be used to verify terms, such as the authoritative corpus BNC and the Corpus of Contemporary American English (COCA), which can assist in the analysis of polysemy terms, and translators can also understand the more widely used term variants by comparing the word frequency of synonymous terms, so as to make the translation more understandable. In the compare column, enter the terms to be compared, and translators can quickly search the frequency of use of each term, and can also search for the collocation of each term. Enter one term to be searched in the list column to search for the word frequency, source, translation, and context of the term, and if translators are not sure about the usage of the term, they can also check the context of the term for reference. A synonym in English is a word that makes language specific, vivid and accurate. In the translation process, if synonyms are not used properly, it will not only make the language monotonous, but also sometimes prone to errors. Synonym analysis is a necessary ability for translators, and only by knowing

their differences can they accurately grasp the meaning of the original text while translation and accurately convey thoughts of the original author.

#### 4. Conclusion

Terminology is the soul of petroleum science and technology translation, and term variation is an inevitable phenomenon in petroleum science and technology translation, and how to translate the terms into communicative professional discourse is still a topic that science and technology translators need to practice, think about and summarize continuously at a time when translation software and machine translation engines are maturing. The terminology collected in this paper is only from one oil project, which is not very comprehensive, and more detailed statistics and analysis still need to be improved. The style of petroleum scientific and technical texts has the characteristics of abounding technical terms, concise and accurate words, and rigorous grammatical structure. When conveying information, it is necessary to achieve objectivity, that is, to take the original text as the core, faithfully, accurately and objectively reproduce the original text, and to dilute the functions of “expression, aesthetic and communication” of language. When translating petroleum scientific texts, it is necessary to be faithful, accurate, fluent, and standardized. As a translator, only on the basis of fully knowing and understanding the connotation of the text, carefully consulting professional authoritative dictionaries, improving the ability of terminology retrieval, and translating terms in a standardized and accurate manner, can we effectively promote the information exchange and dissemination of petroleum science and technology.

#### Conflicts of Interest

The authors declare no conflicts of interest.

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