

On Chinese Translation of Petroleum Science and Technology English Abstracts under the Guidance of Catford's Translation Shifts Theory--Taking *Petroleum* as an Example

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Abstract: It is well-known that the development of petroleum science and technology still shows its importance despite the advent of clean energy resources. It is a subject that needs special training, let alone its translation. This paper intends to explore the abstract translation of the Petroleum Science and Technology English under the translation shifts theory's level shifts and category shifts that includes the structure-shifts, class-shifts, unit-shifts, and the intra-system-shifts, which will analyze its typical characteristics like its unique words, passive and long sentences, discourse, nominalization, and the ways of translating them. All the examples are excerpted from the WeChat official account of Petroleum by the author, hoping to give translators a better understanding of the abstract translation of Petroleum Science and Technology English.

Keywords: Petroleum Science and Technology English, Petroleum, Abstract translation, Catford's translation shifts theory

1. Introduction

Searching for the topic on the CNKI, the author finds that only of 63 papers have discussed the translation of Petroleum Science and Technology English in the past twenty years, and the foreign papers about this topic even smaller. Some scholars study the characteristics of this kind of text and the overall translation of it. Being an important subject, Petroleum Science and Technology English is transforming its role into global communication and cooperation. As we all know that the abstract of a paper is a refined summary of the whole text, and how to handle the abstract translation of such specific text is of great importance to whether the readers will fully understand the essay or not. Besides, the abstract of this text is different from the abstract translation of other texts, for it stresses more on the concise and coherence of the sentences. This article intends to discuss the characteristics of Petroleum Science and Technology English's abstract translation and the methods of dealing with them combined with the level shifts and category shifts of the Catford's translation shifts theory.

1.1 Writing Standard of Petroleum Science and Technology English

Different types of subjects have different writing standards of its paper, and the abstract of Petroleum Science and Technology English is of no exception. Being an important subject based on petroleum, the abstract writing of such text demands not only the full representation of the main idea, being concise and to the point and using the specialized words and phrases, but also the unique aspect of different types of abstracts. When it comes to write an essay, there are some basic norms that a writer is supposed to follow. According to the regulations of UNESCO, any published paper must be accompanied by a short abstract of its paper to help readers better understand the contents of the text. There are four basic elements in writing the contents of an abstract based on the national standards, which are highly concentrated, accurate, complete, and concise to introduce the research purpose, methods, achievements, conclusions.^[3] As for the keywords, they are the keywords or terms selected from the papers to express the purpose of full-text topic and content information, generally containing 3 or 5 words.

1.2 Words and Text Features of Petroleum Science and Technology English

Petroleum Science and Technology English is a subject based on petroleum. Most of the words of Petroleum Science and Technology come from our daily life, while being used in different fields, which entitles them to special professional significance. Petroleum Science and Technology English also has the characteristics of strong professionalism and rigorous logical norms, which makes it different from other texts in the following aspects of words, sentences, and discourse.

1.2.1 About Its Words

The most different part of Petroleum Science and Technology English is its terms, and sometimes, the words in Petroleum Science and Technology are pure scientific words or words derived from Greek or Latin. Usually, a word contains more than one meaning in different situations, which is a common phenomenon in English, and it also exists in Petroleum Science and Technology English. Translators must choose different meaning of a word based on the specific context, which involves the external context and internal context.^[6] For instance, the word “Christmas” in daily conversation, people tend to regard it as a special festival among foreign countries, just as the Spring festival in China. Taking the phrase “Christmas Tree” as an example, people may define it as a tree decorated for celebrating the festival of Christmas from its literal meaning. While in fact, the phrase “Christmas tree” has nothing to do with festivals, but is interrelated with the petroleum device, which is a wellhead device used to extract oil. In addition, there is also a common nominalization phenomenon in Petroleum Science and Technology English. In terms of the characteristics of English, a sentence usually contains only one predicate, thus causing the application of other part of speeches to express more meaning, especially the usage of noun.

1.2.2 About Its Sentences

Unlike other literal translation, the papers of Petroleum Science and Technology English are more objective, and the author’s subjective opinion and emotions should be avoided. In case of its sentences, context is usually combined with passive and several long and difficult sentences in a bid to show real things, phenomena, and processes. As for the passive sentence, it is common that passive voice is applied in scientific and technological articles. This is because scientific and technological style reflects objective facts and scientific inferences based on them, the use of language requires objectivity and universality, and using the passive voice can avoid the difficulty of deciding the performer in the Petroleum Science and Technology English. In Chinese, active voice is often used to describe things but not passive voice, thus habitual Chinese expression should be taken into consideration when it comes to translating them.

Another important feature of Petroleum Science and Technology English is its long and difficult sentences, for English prefers the usage of long sentences while the Chinese prefers the short one. In terms of different long and difficult sentences, the method of recasting, addition and conversion should be appropriately applied. Therefore, learning how to handle the different translation of different sentences is also important for translators. In addition, Petroleum Science and Technology English also prefers to use different tenses, beside the simple present tense, other tenses are also used to express a particular point or a simple fact.

1.2.3 About Its Discourse

Discourse (paragraph or sentence) is a formal logic concept and a conceptual relevance carrier.^[4] And sentence-to-sentence cohesion and coherence between concepts and themes are two main features of a text, whether it is English or Chinese, scientific, or literary. Cohesion and coherence are the important features of discourse in Petroleum Science and Technology English. If the words and sentences are connected naturally, the writing will be smooth. Also, if the whole text is coherent and has no ambiguity, the central meaning of the target language will be clear and there will be no obstruction in reading for readers.

Cohesion can be divided into structural cohesion and semantic cohesion. Structural cohesion includes information structure, “theme-rheme” structure and dual parallelism. There must be unknown information and known information in a sentence.^[6] Semantic cohesion includes using different pronouns like personal pronouns, demonstrative pronouns, and using various connectives and using synonyms, etc. The analysis and understanding of the cohesion is useful for understanding the source text and producing the translated text.

Discourse coherence is the consistency of the meaning of the whole paragraph, which runs through

the whole theme, including basic concepts and secondary concepts. The basic concept is the organizational core and control center of the text; Secondary concepts are intended to further illustrate or develop basic concepts. It is controlled by basic concepts in the organization of texts. ^[6]

2. The Catford's Translation Shifts Theory

The study of translation transformation can date back to the 1950s when Jean-Paul Vinay and Darbelnet Jean published their co-worked book *the comparative stylistics of French and English: a methodology for translation*, in which they put forward the direct translation and oblique translation and gave their viewpoints on conversion of words and part of speech. ^[8] This lays a solid foundation for the further development of the later translation shifts theory.

Being a well-known British linguist and translation theorist, Catford was born in Edinburgh, Scotland on March 26, 1917. Catford specialized in French language and literature, who has studied both at Royal High School in Edinburgh and University of Edinburgh. ^[5] *A Linguistic Theory of Translation* is one of his important works, in which he described some important concepts of translation, including the "translation equivalence" and "formal correspondence". He put forward that formal equivalence will be carried out when the source language enters the target language, which is also known as what today we call the part of speech in English. There are two categories of transformation, and one is the level shifts which is mainly about the translation between words and grammar, the other is the category shifts which can be specifically divided into structure-shifts, class-shifts and unit-shifts and intra-system-shifts. ^[1]

3. Abstract Translation of the Petroleum Science and Technology English under Catford's Translation Shifts Theory

The abstract is the embodiment of an article, which aims to make readers quickly understand the general idea of an article, so it is particularly important to do a good job in translating it. Then, under the guidance of Catford's translation theory, this thesis will analyze the examples of abstract translation of petroleum scientific papers in detail and discuss how the translation of abstract of Petroleum Science and Technology English embodies the level shifts and category shifts of the Catford's translation shifts theory.

3.1 Level Shifts

Level shifts means that a source language item at one linguistic level has a target language equivalent translation at different linguistic levels, ^[1] which mainly contains the shifts between the words and grammar. In Chinese, there are no obvious signals that can show the change of tense, voice, and tone, while the changes of singular and plural nouns, tense, voice, and mood often occur in English. Therefore, to properly deal with the translation of such conversion, thus comes the level shifts. In the process of translating the abstract of Petroleum Science and Technology English, there are conversions between tenses and the singular and plural forms.

3.1.1 The Use of Tenses

In Chinese, there is no tense changes like in English, and Chinese mainly uses implicit ways to express the tense of events, while English has obvious distinction between tenses and prefers to utilize explicit markers to express the time of events. In terms of the translation of petroleum paper's abstract, shifts from word to word shifts or grammar shifts is a common phenomenon. Example 1:

ST: Drilling through active shale formations has been a challenging practice in the oil and gas industry for a long period of time....

TT: 在长期的石油工业实践中.....钻穿活性页岩地层一直极具挑战性。

Chinese is an ideographic character, which mainly emphasizes thinking in images. The interconnection of various components in sentences mostly depends on the connection of semantics, and there are few conjunctions, without any change of complex tenses, nominative and accusative changes, and morphological changes. English is phonography, which mainly emphasizes logical thinking, hypotaxis, and the changes of person, number, and form. ^[11] When expressing complex ideas, English mainly relies on the grammatical means of language itself, connecting all components with the connectives, and its predicate verbs have changes in person, tense, and number. According to the level

shifts in Catford's translation shifts theory, a word can be transformed in equivalence with the targeted and linguistic situation. In this sentence, instead of the commonly used present tense, the predicate "has been" shows the time category of the present perfect tense. If the translation is in concordance with the English grammar, the word-for-word translation can be "已经是一个挑战性的实践" in Chinese. However, this kind of translation is not very authentic and conformed with the habits of Chinese and the Chinese culture, as there is no obvious change of tenses in Chinese like English but some words that show the meaning of tenses. Therefore, the translator conforms with the level shifts by translating it into the underlined version in the translated text, which not only makes it easy for readers to understand its meaning but also better master the main idea of the article.

3.1.2 *Passive voice-From Passive to Active*

The task of Petroleum Science and Technology English is to explain and express the essential characteristics of objective things, the changing process and the relationship between the objects and other things.^[7] The usage of passive voice is an important means to pursue objectivity and standardization in scientific and technological writing. Unnecessary personal pronouns, subjective assumptions can be properly avoided in it, and is conducive to the expansion of sentences which conveys a large amount of information with outstanding emphasis. The conversion from passive voice to active voice is also reflected in the abstracts of Petroleum Science and Technology English, and subject conversion is often used to deal with the passive sentences. Typical example is listed as Example 2:

ST: Based on the data of..., the influencing factors of SRV fracturing in tight oil reservoirs were analyzed.

TT: 基于....等资料, 分析了致密油藏 SRV 压裂的影响因素。

In general, Chinese is more accustomed to the statement of personification, which prefers to an active object or living object to act as the subject, while English pays more attention to the objectivity, which often uses an inactive or lifeless object to serve as a subject.^[10] Though both Chinese and English utilize some passive sentences to convey certain passive meanings. Passive voice used in the scientific English text is the typical, which is often used to highlight the objectivity and authenticity of things. Therefore, when it comes to the "things" being the subject, passive voice is often used. However, to adjust to the habitual patterns of Chinese, passive voice needs to be transformed into the active ones to make sure that no misunderstanding will occur during the translation process. In addition, passive voice is also used to make the readers feel that the point is an objective view rather than the personal opinion. In other words, as one thing is being placed as the subject, the passive voice is then used to show that it is conducted by a person, not the thing subjectively doing it. In this sentence, the subject "the influencing factors of SRV fracturing in tight oil reservoirs" is the thing, and the word "analyze" is the predicate, which means clearly figuring out something, and the performer of such analysis ought to be a person. The underlined Chinese translation "分析了" of the translated text also indicates that the translation converts the passive voice into the active voice. And though Chinese utilizes no change of forms to express the meaning like English, there are words in accordance with the morphological meaning of English, like "了" and "已经" and so on. The target translation also combines these knowledge of Chinese grammar by using the word "了" in Chinese, making a thorough understanding of the sentence in the process of translating.

3.1.3 *Conversion of Singular and Plural Nouns*

Chinese pays little attention to its forms and whether its syntactic structure is loose or not, while English stresses more about the importance of changing the forms and the rigidity of the syntactic structure.^[9] Compared with English, there is no conversion between the words and its part of speech as well as the change of singular forms into plural forms in Chinese. While this phenomenon is obvious in the translation of the Petroleum Science and Technology English, especially in its abstract translation. Example 3:

ST: The results are that the physical models described in the original paper are clearly incorrect.

TT: 结果表明, 该论文中描述的物理模型有误。

Chinese is related to non-inflectional language, which is a morphological change with no strict meaning. There is no case changes in Chinese nouns, and no difference in part of speech and no obvious changes between singular and plural forms, while English is rich in language forms, which is also called the marked language. English prefers to use the change of prefix or suffix of the words, the change of singular and plural nouns and cases as well as the different tenses of verbs.^[9] The difference

between Chinese and English should be taken into consideration by the translators and proper conversion between the two languages is needed in the translation process. In this sentence, instead of translating the “The results are” and the “physical models” in the source text through the literal translation into the plural meaning of “这些结果” and “这些物理模型” in Chinese, the translator translates “the physical models” into the underlined version in the translated text with no plural forms of the target language but conforms with the absence of morphological changes in the characteristics of Chinese grammar. This translation also simplifies the appositive clause of the source text into the verb-object structure in Chinese, which is “结果表明” in Chinese, reflecting the habits of Chinese writing and also shows the conversion between English plural nouns into the Chinese singular nouns. This kind of conversion of singular and plural forms of the nouns between Chinese and English also belongs to the level shifts of the translation shifts theory.

3.2 Category Shifts

Category shifts is a formal correspondence of deviation of relevant components and belongs to the transformation at the same language level. Catford further defines it into the structure-shifts, class-shifts, unit-shifts, and the intra-system-shifts.^[1]

About the structure-shifts which refers to the linguistic structural shifts that Catford defines it as the most common form of category shifts at all levels of translation, mainly occurring between the grammatical structures of the source language and the target language. The class-shifts includes the transformation of verb into a noun or adjectives into adverbs. Unit-shifts, also known as hierarchical conversion, refers to the conversion between five aspects: sentences, clauses, phrases, words, and morphemes. The intra-system-shifts means the source language and the target language have a formal correspondence with each other. And in Petroleum Science and Technology English, the translation of Chinese into English also contains such shifts, especially the analysis of nominalization structure and how the conversion shows in the long and difficult sentences and the cohesion as well as coherence in the discourse.

3.2.1 Structure-shifts-Long and Difficult Sentences

As petroleum science and technology English must state the facts or describe a particular process, it is inevitable to use a lot of modifiers and clauses, thus making the sentence looks longer and more difficult, for Chinese emphasizes semantic structure, while English emphasizes syntactic structure.^[2] Besides, Chinese is more implicit, and it is often described by a sentence pattern or topic sentence which regards the first component of a sentence as a topic for comment, but the theme does not necessarily act as a subject in grammar; By contrast, English pays attention to highlighting the key content, so it usually uses subject-predicate structure to express the content, which is more direct and clearer. Thus, the shift between the theme and key point when translating English into Chinese is imperative. In dealing with the long and difficult sentences, methods like recasting are often used to translate into the target Chinese language. Example 4:

ST: Being one of the most commonly performed EOR methods, polymer injection is used to increase the mobility ratio and decrease water relative permeability....

TT: 注入聚合物是最常用的提高采收率(EOR)方法之一, 其目的是提高流体的流度比, 降低水的相对渗透率....

Recasting method refers to intentionally disrupting the order of the source text and regrouping the meaning groups according to the expression habits of the target language. As English prefers to utilize long sentences to express complex ideas, while Chinese tends to use several short sentences to narrate at different levels^[10], the translator needs to recast the form of the source text in accordance with the habit of Chinese. In this sentence, the source text is a long English sentence with the main parts of subject and predicate, while the Chinese translation divides it into four parts. As Chinese is more likely to focus on a certain topic and gives the detailed explanations about it. Therefore, in this sentence, the main topic is “注入聚合物” and the other three sentences are the detailed explanations of the theme. The Chinese translation conforms with the habits of Chinese writing and has no clear boundaries among sentences. By recasting it into four parts is also following the principle of structure-shifts of the translation shifts theory. Besides, according to the semantic cohesion, there are different kinds of linking verbs are used, such as and, so, but. In this sentence, the linking verb “and” links the verb “increase” and “decrease”, while the translation does not reveal the relationship between the two by translating the word “and” into “和”, and this is because in Chinese, we seldom use these all kinds of pronouns or linking verbs, for there are different cohesive devices between Chinese and English, and they are seldom used in Chinese.

3.2.2 The Class-shifts ——Nominalization Structure

Part-of-speech conversion refers to the conversion of one part of speech in the source language into another part of speech in the target language. In English to Chinese translation of Petroleum Science and Technology English, there are conversions between verbs and nouns, nouns and adjectives, adjectives, and adverbs, and so on. Moreover, the nominalization of Petroleum Science and Technology English is the typical one.

Nominalization structure uses noun phrases to displace clauses and verb structures, which is also known as the metaphorical forms in English. For instance, the word “action” is the result of adding a derivative suffix “ion” to the verb “act”. It can be used to deal with the language organization based on preserving the characteristics of English language and it is commonly used as a subject which makes the sentence more concise and clearer. Example 5:

ST: To gain a deeper understanding of tight sandstone reservoirs and draw on the development experience of hydraulic fracturing....

TT: 为了加深对致密砂岩储层的认识, 吸取水力压裂的开发经验....

Different nations have different thinking modes and different language orders for the same things. Chinese and English belong to different language families, in which Chinese belongs to the Sino-Tibetan family and English to the Indo-European family.^[11] English tends to express itself with morphological changes or root changes of words while Chinese has no such obvious changes. Besides, English has different levels, which can be divided into the original, comparative, and superlative according to different degrees. As Chinese reflects some static realities in a dynamic perspective, and English is just the opposite, which tends to express dynamic realities through some static adjectives.^[10] Sometimes, English adjectives can be transformed into some verbs that show the same feelings and ideas in Chinese. In the source language sentence “To gain a deeper understanding of tight sandstone reservoirs and draw on the development experience of hydraulic fracturing”, and the word “deeper” in the source text is the comparative form of the word “deep”, which is also an adjective in English and it can be literally translated into “更深层次的认识” in Chinese. However, the Chinese translation converts the nominalization structure “a deeper understanding of...” into the Chinese verb “加深...”, transforming the English adjective into a Chinese verb, which not only shows the verbalization tendency of Chinese but also combines the conversion method of translation to transform the parts of speech expressed in the source language based on the difference between Chinese and English. This kind of conversion between Chinese and English also belongs to the class shifts in the Catford’s translation theory.

3.2.3 Unit-shifts and Intra-system-shifts

Unit-shifts is involved in category shifts, which mainly includes the transformation among morphemes, words, phrases, and sentences. For example, a word in the source language becomes a phrase or sentence after being transformed into the target language. While the intra-system-shifts means the source language and the target language are roughly consistent in forms. In the abstract of Petroleum Science and Technology English, the unit-shifts and intra-system-shifts are also very important, especially when handling with certain sentences. Sometimes, to make the balance between the source text and the target text, some compensations methods like addition and conversion are also used in the process of translating. Example 6:

ST: The proposed approach can be used to obtain analytic solutions which provide physical insight into the phenomena under scrutiny....

TT: 本文提出的方法可用于获得分析解决方案, 得出的方案可使我们仔细审查出现的各种现象....

English prefers to use long and difficult sentences, most of which are complex sentences, while Chinese tends to use short sentences and sometimes, Chinese tends to repeat some words to strengthen the tone, while English will avoid using the same words over and over again. In the process of translating English sentences into Chinese sentences, the information center of the source text should first be determined and then the original information ought to be reorganized in terms of the different ways of thinking in Chinese and English. It is common to see that sentences in English often contain a sentence of various additional components, various clauses and constitute a long sentence as well, while Chinese sentences often use independent clauses to explain things. Besides, in terms of the discourse of this text, the pronouns in the source language should be demonstrated in the target language. Therefore, in this sentence, the source language contains an attributive clause led by “which”, being the subject in the following clause, which is the Chinese translation “得出的解决方案”. This Chinese translation using the addition method by complementing the subject “得出的解决方案” in the

attributive clause and divides the attributive sentence into the independent clause. This kind of sentence transformation belongs to the unit-shifts, which is also regarded as an equivalent translation of the source language, which not only expresses the information of the source language completely, but also avoids the length of long sentences.

Sometimes it is unlikely for the translators to find the exact and complete equivalence in the target language while translating the source text in the abstract of the Petroleum Science and Technology English, but the translators can utilize some translation methods to strive for a roughly equivalent structure of the source text, and then it comes to the guidance of the intra-system shifts of Catford's translation theory to make a proper translation. Example 7:

ST: The widespread application of thermal EOR methods....was found to be successful, with very favorable impacts on mobility ratio from the addition of thermal energy to the reservoirs.

TT: 热采提高采收率法....效果显著; 因其增加了油藏的热能, 降低了流度比, 更加利于油气采收。

Prepositions are important functional words in English, which have rich lexical meanings. Sometimes, prepositions can be used to express the meaning of some verbs in Chinese in terms of different collocation.^[10] In this sentence, by using the method of conversion and taking the function of English prepositions into consideration, the translator translates the source language “with very few favorable impacts on mobility ratio” into a verb sentence in the underlined target text, instead of the word-for-word translation into “对流度比有很好的影响” in Chinese. The method of conversion refers to the conversion of parts of speech, sentence patterns and voices in the source sentence to make the translation conform to the expression mode, method, and habit of the target language in the translation process. To make the translated version more in accordance with the structure and meaning of the source text, the translator made proper conversion by translating the source language “from the addition of thermal energy to the reservoirs” into the underlined version in the target text instead of “从储层中加入热能”. Instead of conforming to the word-to-word translation method but making proper conversion in the target text and adding the result “更加利于油气采收” in the translation. Though not in complete accordance with the source text for the translated version utilizes the method of addition to better convey the meaning of the source text, the translator succeeded in conveying its meaning by adding the result of the process, making a rough equivalence of the structure of the source text, which shows the transformation theory of intra-system-shifts, in other words, it is not completely equivalent to the source language, but roughly equivalent to the structure and form of the source language on the basis of accurately reflecting the content and meaning of the source language.

4. Conclusion

The process of translation is a typical case of translation shifts, and the translation between English and Chinese also contains the shifts among words, phrases, and sentences. Having a good command of these shifts among them is also of great importance to the abstract translation practice in Petroleum Science and Technology English. This article analyzes the abstract translation of Petroleum Science and Technology English from Catford's translation shifts theory, including the level shifts which contains the shifts of tenses and singular and plural forms between Chinese and English, and Category shifts like the structure shifts, class shifts, unit shifts and intra-system shifts, and the methods of recasting, addition and conversion of dealing with such specific text. It has important guiding role and reference significance for abstract translation of Petroleum Science and Technology English.

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