

## FUNCTIONAL-SEMANTIC FEATURES OF THE LEXICON IN THE OIL AND GAS FIELD: PETROL MICROFIELD

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### Abstract

*It is well known that the terminology of ESP (English for Specific Purposes) is rich and requires a significant interpretation of Romanian-English semantic equivalents, and the knowledge of the technical field is fundamental in the science of communication. With the evolution of different fields of the technique, it is required to develop the lexical material, which consists of lexical systems (functional-semantic fields). Therefore, there is a need to use specific language for certain and unique technical concepts in order to correspond to the development and enrichment of the specific lexicon. The specialized terms in the field of oil industry, within contexts from different conceptual and semantic fields acquire new semantic nuances due to the context and develop various expressions and stable word combinations within the field.*

**Keywords:** ESP (English for Specific Purposes), specialized language, specialized lexicon, general language, general lexicon, general and specialized functional-semantic field

### Rezumat

*Este bine cunoscut faptul că terminologia ESP (English for Specific Purposes) este bogată și presupune o interpretare semnificativă a echivalențelor semantice româno-engleze, iar cunoașterea domeniului tehnic este fundamentală în știința comunicării. Odată cu evoluția diferitelor domenii ale tehnicii, se impune dezvoltarea materialului lexical, care se constituie în sisteme lexicale (câmpuri funcțional-semantice). Așadar, apare necesitatea folosirii unui lexic specific pentru a denumi noțiuni tehnice unice care să corespundă dezvoltării și îmbogățirii lexicului specific. Termenii specializați din domeniul industriei petroliere, aparținând diferitor câmpuri semantice conceptuale, capătă nuanțe semantice noi datorită contextului și dezvoltă diverse expresii și îmbinări stabile de cuvinte în domeniu.*

**Cuvinte-cheie:** ESP (English for Specific Purposes), limbaj specializat, lexic specializat, limbaj comun, lexic comun, câmp funcțional - semantic general și specializat

The ESP (English for Specific Purposes) terminology is rich and involves a significant interpretation of the Romanian-English semantic equivalents, and the knowledge of the technical field is fundamental in the science of communication. Undoubtedly, technical English (TE) is represented by independent lexical units that bring additional knowledge to the technical notions and ensure specialized communication in the oil field industry. Specialized language (SL) is a matter of sign theory, conceptual field, language style and variation. The terms, whether they are common with general language (GL), or they are specialized, located in contexts from

different conceptual semantic fields, acquire new semantic nuances due to the context.

Although the historical aspect seems questionable, one thing is certain: the study of technology and technique plays an important role in their evolution and development, and the study of technical language is still in the attention of researchers. Regarding a possible classification of the technical language in the field of oil and gas industry, we must specify that we did not find any classifications performed by experts in linguistics, so we would like to propose a classification according to the key activities in the field. Therefore, the approach/classification we propose is related to the activities in the field, providing vocabulary specific to each area, because the facilities and systems in this industry are broadly defined, depending on their use during the production flow.

The main sectors of activity in the field are highlighted by terms (lexemes) that specialized language has taken from general language.

Even though there is a considerable age of this industry, namely around the 4<sup>th</sup> century, when the first oil wells in the world were drilled in China with the help of some simple bamboo poles, we would like to mention that the modern oil industry began in the middle of the 19<sup>th</sup> century, on August 27, 1859, when the first oil reservoir was discovered (near Titusville, Pennsylvania). And with the evolution of this branch, both a specialized conceptual field and a technical code have been developed, which scientists mainly use.

Therefore, the scientific lexicon is based on the general lexicon which, through various semantic processes, has been influenced, adapted or even modified according to the needs of the specialized field. The scientific lexicon offers words transformed from the general lexicon which incorporates them, but also extends their meanings.

The oil and gas industry is usually divided into three major sectors, with terms specific to each one: *Upstream* (or *Exploration and Production - E&P*), *Midstream* and *Downstream*. The term *Upstream* or *E&P (Exploration & Production)* is used in the oil exploration and production sector, as it contains activities associated with the discovery, recovery and production of crude oil and natural gas. *Upstream* refers to wells (oil and gas deposits discovery, feasibility studies, drilling, well depth, design, construction, operation and management). The *Upstream* Sector includes the searching for some potential subsurface or underwater crude oil or natural gas deposits, drilling some exploratory wells, and subsequently drilling and operating the wells that recover and bring the crude oil or raw natural gas to the surface. Let us continue with a much more eloquent explanation: "An *Upstream* activity is one that takes place before oil production, for example, exploration or research" (Cobuild, 2013, p. 146). This term can be found in different phrases, such as: *Upstream facilities, Upstream operations, Upstream activities*.

The term *downstream* is used for the crude oil refining sector, natural gas processing and purifying, as well as for the marketing and distribution of crude oil and natural gas products. The downstream sector is the refining of crude oil and the processing and purification of raw natural gas, as well as the marketing and distribution of products derived from crude oil and natural gas.

However, in a specialized dictionary we find this term explained as follows: "*Downstream* describes equipment, facilities or systems used after crude oil has been produced" (Cobuild, 2013, p. 146).

Like *Upstream*, this word can also be found in various phrases, such as: *Downstream plants*, *Downstream operations*.

*Downstream operations* are represented by the oil and gas processes that occur after the production phase, up to the selling point. Downstream oil and gas production involves everything related to the post-production of the crude oil and natural gas activities.

The term *Midstream* is used to correlate all activities in the upstream and downstream sectors. It is mainly used for transport and storage services of resources, such as collecting systems.

While studying the translation of these words, which belong to the same lexical register, in the general English dictionary, we have found that the term *Upstream* is translated as follows: "1. *adv.* în susul apei/râului etc. 2. și *fig.* contra curentului 2. *adj.* 1. care urcă în susul râului 2. *fig.* care merge contra curentului" [Levițchi & Bantaș, 1999, p. 1243]. We have noticed the same thing with the term *Downstream*: "*adv.* în aval, la vale, în josul apei" (*idem*, p. 260).

It should be noted that the term *Midstream* is not included in the general English dictionary, at least we did not find it.

Next, we discuss the lexicon of the functional-semantic field of the oil and gas industry, namely some representative terms of this field. We try to present the semantic fields of different lexical units from this area, comparing them to the general language, in order to notice their lexical structure, considering the etymological, semantic, phraseological approach or even word formation.

Firstly, we propose to start by focusing on the polysemantic word *oil/ulei* and its semantic structure. This is found in Romanian dictionary "Dexonline" with the following explanation: "1. rocă sedimentară lichidă, uleioasă, de culoare brună-negricioasă, mai rar gălbuie, cu reflexe albastre-verzui, cu miros specific, formată dintr-un amestec natural de hidrocarburi și de alți compuși organici, care se extrage din pământ și care servește drept materie primă în industria chimică; țiței. ◇ Petrol sintetic = combustibil cu proprietăți asemănătoare cu cele ale țițeiului, obținut pe cale sintetică din cărbune sau din oxid de carbon, prin hidrogenare catalitică. 2. Derivat lichid

al petrolului (1), folosit la arderea în lămpi cu fitil pentru iluminat sau încălzit; gaz. 3. Sortiment de petrol (1). – Din fr. *pétrole*”.

We have noted that the definition of the polysemantic English word *petroleum* given by the general English dictionary is rather simplistic: "A dark, thick oil obtained from under the ground, from which various substances including petrol, paraffin, and diesel oil are produced" (Cambridge Dictionary).

The specialized dictionary offers us for *petroleum* the equivalent *petrol*, and for *petroleum gas*, *gas associated with oil*. However, the *petroleum pipe-line* combination is translated as "conductă de țiței - oil pipeline" (Avram & Troquet, 2000, p. 137) and not "de petrol", which leads to a certain ambiguity in translation.

Generally speaking, the term *petroleum* is used for referring to *oil* in liquid form. However, there are considerable variations related to its language use, because within specialized dictionaries we find this term as a mixture of hydrocarbons, which exists in a liquid form within subsurface geological formations. Petroleum products are obtained from the processing of oil and other liquids in refineries (processing plants). Oil is a broad category that includes both crude oil and petroleum products. The terms *oil* and *petroleum* are sometimes used interchangeably in this field.

Furthermore, we notice the definition given by different dictionaries, where we find both terms having the same explanation: crude oil, or petroleum; "Petrolul sau țițeiul, împreună cu cărbunele și gazele naturale, fac parte din zăcămintele de origine biogenă care se găsesc în scoarța pământului. Petrolul, care este un amestec de hidrocarburi solide și gazoase dizolvate într-un amestec de hidrocarburi lichide, este un amestec de substanțe lipofile" (Dexonline).

The term *petroleum* has developed various, rich and complex lexical-semantic fields, thus becoming part of multiple combinations established by words. One of the most important would be a *petroleum engineer* (inginer petrolist) and not an *oil and gas engineer*, because a *petroleum engineer* is the person who is involved in most of the stages regarding the appraisal, development and production of the oil and gas reservoir whose objective is to maximize oil recovery, reduce costs and impact on the environment. The responsibility of a petroleum engineer is to ensure that oil and gas are produced in the most efficient way.

The semantic fields of the terms *oil* and *petroleum* are quite rich. Therefore, we propose below some lexical units of these microfields that we find abundantly in the work field:

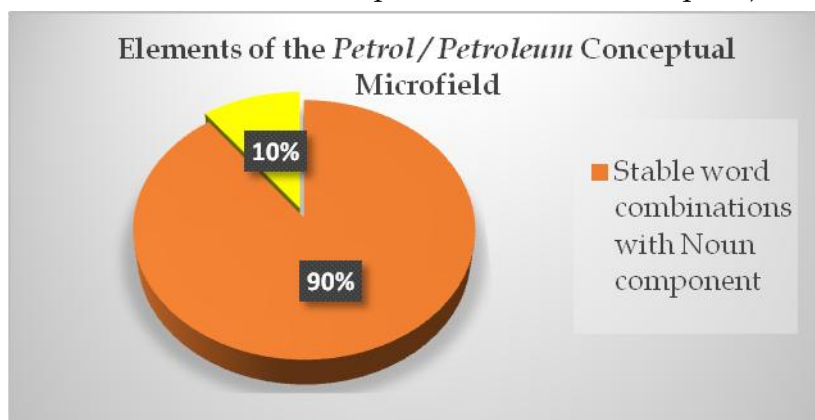
English Units	Romanian Units
<i>petrol</i>	<i>țiței, benzină (auto)</i>

<i>petrol barrel</i>	<i>butoi de benzină</i>
<i>petrol consumption</i>	<i>consum de benzină</i>
<i>petrol depth gauge</i>	<i>indicator de nivel de benzină</i>
<i>petrol engine</i>	<i>motor cu benzină/cu carburator</i>
<i>petrol tank</i>	<i>rezervor de benzină</i>
<i>petrol tanker</i>	<i>cisternă de benzină</i>
<i>petrol vaporizing oil</i>	<i>benzină grea de tractor</i>
<i>petrolatum liquid</i>	<i>ulei medicinal</i>
<i>petrolatum wax</i>	<i>ceară de petrol</i>
<i>petroleum</i>	<i>bitum natural</i>
<i>petroleum</i>	<i>gaz; petrol; țiței</i>
<i>petroleum acid</i>	<i>acid petrolic</i>
<i>petroleum asphalt</i>	<i>asphalt / bitum de petrol</i>
<i>petroleum bloom</i>	<i>fluorescența țițeiului</i>
<i>petroleum car</i>	<i>vagon-cisternă; autocisternă</i>
<i>petroleum composition</i>	<i>compoziția țițeiului</i>
<i>crude petroleum</i>	<i>țiței brut</i>
<i>petroleum deposit</i>	<i>zăcământ de țiței</i>
<i>petroleum drilling</i>	<i>foraj de sonde de țiței</i>
<i>petroleum engineer</i>	<i>inginer petrolist</i>
<i>petroleum engineering</i>	<i>tehnologia țițeiului</i>
<i>petroleum exploitation</i>	<i>exploatarea zăcămintelor de țiței</i>
<i>petroleum fuel oil</i>	<i>combustibil de petrol</i>
<i>petroleum gas</i>	<i>gaze de sondă / petroliere</i>
<i>petroleum geology</i>	<i>geologia petrolului</i>
<i>petroleum industry</i>	<i>industria petrolului / industria petrolieră</i>
<i>petroleum installation</i>	<i>depozit de carburanți</i>
<i>petroleum mineral oil</i>	<i>petrol, țiței (ulei mineral)</i>
<i>petroleum origin</i>	<i>originea țițeiului</i>

As we can see, these units, used primarily in the field of general industry, have developed different expressions, words, or collocations in the field. In conclusion, the word combination *crude oil* (*țiței brut*) is used to name an organic liquid substance, often found underground, consisting of thousands of molecules composed of different hydrogen and carbon atoms, called hydrocarbons. However, the words *petroleum* (petrol), derived from the Latin *petra* (meaning "rocă") and *oleum* (meaning "ulei") are commonly used to refer to *oil*, but may also refer to other related hydrocarbons.

Based on this first presentation of the collection of lexical units, trying to group the specialized terms *oil/petroleum*, where we offer a theoretical and practical basis of the syntagmatic and paradigmatic relations developed by them, as well as a vision on the semantic relations between specialized words according to their semic structure, we may conclude the following:

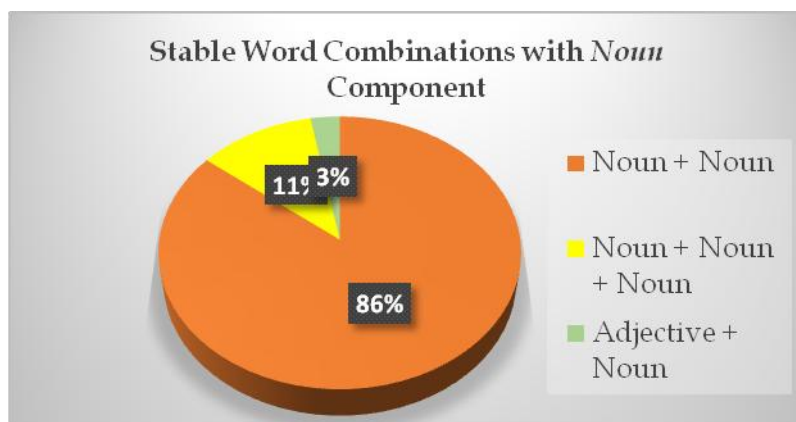
1. The semantic analysis of the semantic fields of the terms *oil* and *petroleum* shows a higher percentage of polysemantic language units than monosemantic ones. Often, the interpretation of a polysemantic lexical unit is difficult to be done without being contextually supported.
2. In the English specialized language structure there are two categories of terms (lexical units):
  - terms that belong to technical SL, such as: *petroleum deposit*, *petroleum drilling*, etc. for English or *oil*, *medicinal oil*, etc. for Romanian language;
  - terms common to SL, as well as to the general one. Here comes the phenomenon of polysemy created by the semantic development of certain technical terms.
3. From a lexical-morphological point of view, we have counted a considerable number of lexical units, stable word combinations with semantic-distributive formulas, having in their composition nouns and verbs (the graph below clearly states that nouns make up the lowest percentage, from a statistical point of view, but stable word combinations with *Noun* component are the most frequent):



The analysis performed on 39 elements from a lexical-morphological perspective helps us to notice that our stable word combinations with *Noun* component being developed in this field by the *oil / petroleum* elements, can be classified into three categories of basic semantic-distributive formulas:

- noun + noun: *petroleum industry*;
- noun + noun + noun: *petrol depth gauge*, *petroleum fuel oil* etc.;
- adjective + noun: *crude petroleum*.

Based on the analyzed examples, we have noticed a higher percentage of the category *noun + noun*, as it is shown in the figure below:



The most significant classifications of language units are based on the structural and syntactic-morphological criteria (noun, verb or adjective structures with two, three or multiple elements). The statistics performed at the level of this conceptual microfield showed us that the highest percentage (over 80%) belongs to the semantic-distributive formula: *Noun + Noun*.

SL used here is a representation of technical and technological equipment, a term-object, concept-object correlation which, together with the terms (lexical units) borrowed from other fields of knowledge, form a precise, accurate, specific and well-defined terminological system; the semantics of lexical units represent the comprehensive support of the terms assigned to the technical equipment.

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