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WORD-FORMATION AND STRUCTURAL FEATURES OF TERMINOLOGICAL UNITS IN THE ENGLISH GEODETIC TERMINOLOGICAL SYSTEM

Rapid development of science and technologies inevitably leads to expansion of subject-specific vocabulary within specialized terminologies. The study of such terminologies, analysis and classification of terminological units, which belong to their structure, is of primary focus in modern linguistics. The presented paper aims at investigating English geodetic terminology and its vocabulary concentrating on word-formation and structural characteristics of geodetic terms. It has been found out, that English geodetic terminology is a well-organized system of terms, which are means of interaction and communication of specialists in Geodesy. Geodetic terms are lexical units that denote special concepts of the geodetic sphere, are in systemic relations with other words of this field and are characterized by high information content and accuracy. One of the main functions of geodetic terms is the nominative one which implies designation of special geodetic concepts.

The system and structural approaches, combined with a complex methodology have been applied to characterize English geodetic terminology and its terminological units, namely, their structure and term-formation features. Special attention has been paid to singling out and analysis of the structural peculiarities of geodetic terms, which have been classified into eight general groups, subdivided into corresponding subgroups. One-stem terms, compound terms and terminological word combinations have proved to be dominant ones. Vocabulary of the studied terminology is also characterized by the presence of abbreviations, symbolic nominations and terms-eponyms. English geodetic terminological units have been further subdivided into three subgroups on the basis of their semantic structure, morphological characteristics and nature of concepts, they denote.

Key words: *terminology, term, English geodetic terminology, term-formation, one-stem terms, compound terms, terminological word combinations.*

Statement of the problem. Modern world is characterized by numerous achievements and developments in different branches of science on national and international levels. Close relationships as well as intensive cooperation among specialists in various professional fields lead to improvement of existing and creation of new technologies, making important scientific discoveries, boosting progress in various branches of economy. International links are greatly dependent on effective communication among specialist from different countries which, in most cases, is done in English. In the competitive world of the 21st century deep knowledge of subject-specific terminological units, which are basic means of concepts representations and information transfer among professionals in a specific field of science and excellent communication skills in English is of paramount importance.

Analysis of recent research and publications. Study of specialized terminologies and their vocabulary has been drawing the interest of philologists for many years. Considerable contributions to the investigation of subject-specific languages and specialized terminologies, analysis of structural peculiarities as well as composition of terms were made by Ukrainian and foreign linguists, namely: I. M. Gumovska (English legal terminology), Z. B. Kudelko (English terminology system of market relations), C. L. Moder (Aviation English), O. M. Riba (German professional language of the oil industry), O. M. Tur (Ukrainian terminology of land management and cadastre), O. D. Tsaruk (English terminology of the oil and gas industry), N. O. Shkolna (terminology of the German professional language of industrial automation), A. Wang, A. (Aeronautical English Vocabulary), etc.

It should be mentioned that from theoretical point of view terminology is commonly analyzed from three different dimensions, namely: 1) the cognitive dimension, which examines the concept relations and thereby how the concepts constitute structured sets of knowledge units or concept systems in every area of human knowledge, as well as the representation of concepts by definitions and terms; 2) the linguistic dimension, which studies existing as well as potential linguistic forms that can be created to name new concepts; 3). the communicative dimension, which investigates the use of terms as a means of transferring knowledge to different categories of recipients in a variety of communicative situations [7, p. 13]. This paper covers mainly structural and compositional characteristics of English geodetic terminological units and is conducted with the regard to linguistic dimension of terminology study.

Task statement. The primary focus of the paper is to investigate the composition of English geodetic terminology and analyze the basic types of vocabulary within it covers concentrating on structural and word-formation features of lexical units with further classification of the studied terminological units and analysis of their productivity.

Outline of the main material of the study. Present-day subject-specific terminologies, including English geodetic terminology, are characterized by accurate, professional vocabulary aimed at delivering precise and univocal information on the one hand. On the other hand, they comprise a great number of more expressive language units (such as metaphors, metonyms) to make new concepts more understandable [5, p. 470].

Terms are effective instruments of communication and exchange of information among specialists in different professional areas. They are the key elements of specialized terminologies and means of expressing special concepts in the sphere of science. Terminological units of different subject fields form separate systems of terms with a definite structure and an internal organization of components [6, p. 112].

While regarding terminology as a system of interrelated lexical units, which function in a particular field of study, it should be underlined that each specialized terminology covers different types of vocabulary that denote subject-specific concepts and are widely used as basic means of communication on a professional level. M.T. Cabre states: "terminology can only be understood in relation to special languages and communication and addresses a variety of purposes, all of which are related to communication and information. For subject field specialists, terminology is the formal reflection of the conceptual organization of a special subject and a necessary medium of expression and professional communication" [2, p. 11].

Each specialized terminology is an integral part of a national language it belongs to. Specialized terms like commonly used language words, belong to the lexical system of language and perform a nominative function [8, p. 144].

English geodetic terminology, studied by us, can be defined as is a collection of terms correlated with the professional field of activity (geodesy) that reproduces the system of concepts of the geodetic field and ensures the processes of nomination within it.

Geodetic terms are lexical units that denote special concepts of geodetic sphere, establish systematic relations to other units of this sphere and are characterized by great informational content and precision. One of their main functions is a nominative one, which is based on the denotation of special geodetic concepts [6, p. 115].

The study material of the paper comprise geodetic nominations, which were selected from the corpus of English as well as English-Ukrainian reference literature in Geodesy. The sources of the material under study were corresponding specialized online and printed dictionaries, encyclopedic dictionaries, glossaries, state standards.

The methodological basis of the conducted research comprises application of general scientific and linguistic methods of study with the focus on structural approach. According to it English geodetic terminology is studied from a structural view as a system of interconnected terminological units. The linguistic and terminological approaches, including synchronic, morphological, semantic and system ones, were used in order to conduct synchronic analysis of English geodetic terms, concentrating attention on structural and term-formation peculiarities of terminological units under study and to classify them into certain groups.

According to the latest linguistic research, lexical units of a language can be divided according to four main aspects: 1) form and structural features; 2) meaning; 3) historical features; 4) features of their use.

Domestic linguists Dyakov A. C., Kiyak T. R., Kudelko Z. B. take into account the peculiarities of terms formation and distinguish the following word-formation types – terms – root words, including indigenous non-derivative vocabulary and borrowed non-derivative vocabulary; – derivative vocabulary, which includes terms formed by suffixation and

prefixation; – terminological word-combinations; – terms-phrases; – abbreviated terms; – letter symbols; – symbols (signs) [3, p. 106–107].

Kovalenko A. Y. focuses on the structure of terminological units and divides them into: – simple (consisting of one word); – compound (consisting of two words and written together or hyphenated); – terminological word combinations (consisting of several lexical units). A similar classification of terms is proposed by Superanska O. V., who, according to the structure of terminological vocabulary differentiates it into: – single-word terms (expressed by one word); – terminological word combinations (including free word combinations, where each of the components can enter into a two-way relationship and linked word combinations, where isolated components may not be terms but in combination they form a terminological word combination); – multicomponent terms (such terms have three-, four- or more components and are presented in a much smaller number than the previous above mentioned types) [1, p. 25].

Terminological word combinations dominate in most specialized terminologies, including the English geodetic terminology. Within the studied terminological system they can be divided into three general groups depending on the nature of components in their structure:

– terminological word combinations, the components of which are independent words that can be used separately and retain their meaning, for example: *cantilever triangulation, levelling survey, transit traverse*, etc.;

– terminological word combinations that have a technical term as one of their components and a commonly used lexical unit as the other one. The composition of such terms is mostly represented by combination of two nouns or a noun and an adjective, for example: *reference ellipsoid, survey point, free adjustment*, etc. This method of forming scientific and technical terms is more productive than the previous one, where both components are independent terms.

– terminological word combinations, both components of which are words of common vocabulary, and only the combination of these words forms a term, functioning within a particular subject-specific terminology and denoting a specialized concept, for example: *true height, side shot,* etc. This way of forming scientific and technical terms is characterized by low productivity.

Analysis of the structure and word-formation features of terms in the English geodetic terminology, has made it possible to classify them into 8 main groups and corresponding subgroups, namely:

1) one-stem terminological units (simple terms or monosyllables), which include:

– indigenous non-derivative vocabulary, e.g: *beacon* (Old English), *gore* (Old English), *line* (Old English), *target* (Old English), *vane* (Old English), etc;

– borrowed non-derivative vocabulary (mainly of Latin, Greek and French origin), e.g: *ellipse* (Latin), *survey* (Latin), *transit* (Latin), *tripod* (Greek), *core* (Old French), etc;

2) derived terminological units, which are divided into:

– terms formed by suffixation, e.g: *compilation, levelling, scaled, spotting, triangulation*, etc.; terms formed by prefixation, e.g: *echometer, geodimeter, readjust, relevel, tachymetry*, etc. or both – prefixation and suffixation, e.g: *recompilation, phototriangulation, pseudoelevation, nonlinear*, etc.;

3) compound terms (or composites) that are written together or hyphenated, e.g: *baseline, half-contour, range-finder, scaleplate, zero-gravity*, etc;

4) terminological word combinations, which cover:

– two-component terminological word combinations, that have proved to be the most productive in English geodetic terminology, e.g: *geodetic azimuth, tacheometric survey, total station, traverse side, trigonometric levelling*, etc.

– three-component terminological word combinations, e.g: *aluminum survey bipod, barometric height increment, inverse geodetic problem, plate table survey, relativistic gravitational theory*, etc.

– multicomponent terminological word combinations. They are presented in a much smaller number than the previous types of terminological word combinations and have proved to be low-productive ones. Here belong for example such terms as: *curvature of normal plumb line, electronic block of geodetic device, height of unit decrease of pressure, oblique-derivative boundary value problem, tidal variation of geodetic height*, etc.

According to the degree of semantic fragmentation, terminological word combinations in the structure of English geodetic terminology have been divided into:

– free terminological word combinations, all components of which have a completely independent lexical meaning that remains unchanged and each of the components can enter into a two-way relationship. Here belong such terms as: *bearing traverse, exact approximation, geoidal normal, scaling function, strip triangulation*, etc.;

– coherent terminological word combinations that constitute semantic indivisibility, the components of

which are the product of secondary nomination, which, taken in isolation, may not be terms, but in combination they form a term, e.g: *fair copy* (of a map), *noisy data, true heading, legend box, map face*, etc.;

5) abbreviations: *GPS – Global Positioning System, GRS – Geodetic Reference System, HEO – High Earth Orbit, TT – Terrestrial Time, VDOP – Vertical Dilution of Precision*, etc.;

6) letter symbols: *b – geodetic latitude, h – height, m – meter, r – radial distance, ω – angular frequency*, etc.;

7) symbols and signs: *F- layer, L-band, X-coordinate, X- and Y- tilt, Y-grid, Y-level, Y-parallax*, etc.;

8) terms-eponyms, that are terminological units, the integral components of which are proper names, related to persons who made significant discoveries and achievements in the field of such science as geodesy [4, p.68]. For example: *Bessel ellipsoid, Keplerian orbit elements, Kulon's torsion balance, Talcott level, Puasson's theorem*, etc.

It should be noted that within each the above mentioned groups, smaller constituent components have also been determined, taking into account:

– semantic structure of the term, according to which the terms of the geodetic sphere are monosemantic, e.g.: *aberration, barograph, iteration, levelling, triangulation*, etc. and polysemantic, e.g.: *unit*: 1) measure; 2) section; 3) assembly; *magnitude*: 1) amplitude; 2) star value; 3) magnitude; *range*: 1) line, rank; 2) distance, length; 3) zone; 4) amplitude; 5) line segment, etc.;

– part of speech, which it belongs to: nouns, adjectives, verbs and others, e.g.: *survey* (Noun), *projection* (Noun), *cadaster* (Noun), *peg* (Noun), *topography* (Noun), *astronomical* (Adjective), *tridimentional* (Adjective), *spherical* (Adjective), *three-axis* (Adjective), *readjust* (Verb), *demark* (Verb), *triangulate* (Verb), etc. The grammatical core of the studied vocabulary consists of nouns (approximately 78.3% of the total number of items), adjectives (approximately 12%) and verbs (approximately 9.1%). Adverbs and other parts of speech (participles, numerals) are represented in a much smaller proportion (less than 1%);

– the concept that is denoted by a particular term: – terms that denote objects or subjects: *assembly, cartogram, coder, (soil reconnaissance) map, (single station) ranger*, etc.; – terminological units, nominating processes: *delimitation, modeling, surveying, tracing, zoning,* etc.; – terms denoting quantities and their units: *error, grade, milligal, nanometer, nanosecond,* etc.

It has been found out that the core of English geodetic vocabulary is represented by one-stem terms, such as: *geodesy, geoid, theodolite, surveying, traversing,* etc., which are the basis for creating other types of terminological units, namely, compound terms and terminological word combinations. For example: *three-dimensional geodesy, astro-gravimetric geoid, cadastral traversing, radar-altimeter surveying,* etc.

Conclusions. Having analyzed the vocabulary of English geodetic terminology with the emphasis on the structure of terminological units and their word-formation peculiarities it has been concluded that dominant lexical units in the studied terminology have proved to be one-stem terms (simple and derived), compound terms and terminological word combinations. The latter are characterized by the highest term-formation potential and are the most numerous, which is mainly due to the constant need to nominate new geodetic concepts (surveys, tools and devices, research, discoveries, etc.) with occur as a result of professional field growth. The rapid development of Earth sciences, the central of which is geodesy and the complexity of geodetic concepts cause the necessity to specify such concepts and thus leads to the use of existing (or creation of new) lexical units for the purpose of additional clarification or nomination of geodetic notions. The studied terminology is also characterized by the presence of abbreviations, letter symbols and signs, as well as terminological units that have proper names in their structure.

The prospects for further research is textual discourse analysis of English geodetic terms with the focus on their contextual meaning and textual functionality.

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Грибінник Ю. І., Галай Т. М. СЛОВОТВОРЧІ ТА СТРУКТУРНІ ОСОБЛИВОСТІ ТЕРМІНОЛОГІЧНИХ ОДИНИЦЬ В АНГЛІЙСЬКІЙ ГЕОДЕЗИЧНІЙ ТЕРМІНОЛОГІЧНІЙ СИСТЕМІ

Стрімкий розвиток науки і технологій неминуче призводить до розширення фахової лексики в межах спеціалізованих термінологічних систем. Вивчення таких термінологій, аналіз та класифікація термінологічних одиниць, що входять до їх складу, є першочерговим завданням на сучасному етапі розвитку лінгвістики. Метою представленої статті є дослідження англійської геодезичної термінології та її словникового складу з акцентом на словотвірних і структурних особливостях геодезичних термінів. З'ясовано, що англійська геодезична термінологія є добре організованою системою термінів, які є засобом взаємодії та комунікації спеціалістів з Геодезії. Геодезичні терміни – це лексичні одиниці, які позначають спеціальні поняття геодезичної сфери, перебувають у системних зв'язках з іншими словами цієї галузі та характеризуються високою інформативністю і точністю. Однією з основних функцій геодезичних термінів є номінативна, яка полягає в позначенні спеціальних геодезичних понять.

Системний та структурний підходи у поєднанні з комплексною методикою було застосовано у процесі дослідження для характеристики англійської геодезичної термінології та її термінологічних одиниць, а саме їхньої структури і термінотвірних особливостей. Особливу увагу приділено виокремленню та аналізі структурних особливостей геодезичних термінів, які було класифіковано на вісім загальних груп, поділених на відповідні підгрупи. Домінуючими виявилися групи однослівних термінів, складних термінів та термінологічних словосполучень. Лексика досліджуваної термінології також характеризується наявністю абревіатур, символічних номінацій та термінів-епонімів. Англійські геодезичні термінологічні одиниці було також поділено на підгрупи на основі їхньої семантичної структури, морфологічних особливостей та характеру понять, які вони позначають.

Ключові слова: *термінологія, термін, англійська геодезична термінологія, термінотворення, однослівні терміни, складні терміни, термінологічні словосполучення.*