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ANALYSIS OF LINGUISTIC AND TRANSLATION ASPECTS IN AVIATION TERMINAL SYSTEMS

AVIATSION TERMINOLOGIK TIZIMLARDA LINGVISTIK VA TARJIMA ASPEKTLARI TAHLILI

АНАЛИЗ ЛИНГВИСТИЧЕСКИХ И ПЕРЕВОДЧЕСКИХ АСПЕКТОВ В АВИАЦИОННЫХ ТЕРМИНАЛЬНЫХ СИСТЕМАХ

Ayaqulov Nurbek Abdug‘appor o‘g‘li
Gulistan State Pedagogical Institute Vice-rector for scientific affairs and innovations, doctor of philosophy (PhD) in philological sciences, associate professor nurbek.ayaqulov.1992@gmail.com, +998915022325

ABSTRACT

The article examines linguistic and translation aspects within the English aviation terminology system. It explores methods for enriching English aviation terminology, conducts lexical-semantic and structural analyses, and discusses strategies for translating multi-component terms, abbreviations, and acronyms from aviation English into Russian.

KEYWORDS: term, English aviation term system, methods of term formation, single- and multi-component terms, abbreviations and acronyms, translation methods.

ANNOTATSIYA:

Maqolada ingliz aviatsiya terminologiyasi tizimidagi lingvistik va tarjima jihatlari ko'rib chiqiladi. U ingliz aviatsiya terminologiyasini boyitish usullarini o'rganadi, leksik-semantik va tarkibiy tahlillarni o'tkazadi, ko'p komponentli atamalar, qisqartmalar va qisqartmalarni aviatsiya ingliz tilidan rus tiliga tarjima qilish strategiyalarini muhokama qiladi.

KALIT SO‘ZLAR: termin, ingliz aviatsiya termin tizimi, termin hosil qilish usullari, bir va ko'p komponentli terminlar, qisqartmalar va qisqartmalar, tarjima usullari.

АННОТАЦИЯ

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В статье рассматриваются лингвистические и переводческие аспекты английской авиационной терминологии. Он исследует методы обогащения английской авиационной терминологии, проводит лексико-семантический и структурный анализ, а также обсуждает стратегии перевода многокомпонентных терминов, аббревиатур и акронимов с авиационного английского на русский язык.

КЛЮЧЕВЫЕ СЛОВА: термин, английская авиационная терминосистема, способы терминообразования, одно- и многокомпонентные термины, аббревиатуры и акронимы, способы перевода.

INTRODUCTION

The cornerstone of any specialized language is its terminology, and aviation English is no exception. As noted by researchers like I. Asmukovich, the evolution of aviation terminology in English spans over two centuries, reflecting the comprehensive development of aviation science and technology from the early days of ballooning to modern space flights [Asmukovich 2011: 112]. L. Tkacheva highlights the twentieth century as pivotal in aviation terminology's history, marking its birth, growth, and rapid advancement [Tkacheva 1972]. Tkacheva also observes that aviation has uniquely integrated terms from diverse fields of knowledge, surpassing other scientific and technical disciplines in its breadth and semantic diversity.

The meaning of a word is not static; it evolves over time due to social, economic, and cultural changes in society, as noted by scholars such as I. Arnold, O. Akhmanova, V. Zvegintsev, A. Potebnya, and others. While a term is a specialized name within scientific and technical fields that facilitates professional communication and is part of modern scientific classification systems [Kovtun 2012: 150], its semantics also undergo changes.

METHODOLOGY

This study employs a descriptive approach to analyze the adaptation of aviation abbreviations into Russian. It synthesizes existing literature and categorizes adaptation methods based on linguistic principles and practical application within the aviation industry. The methods discussed include direct translation,

transliteration, descriptive translation, and the creation of new abbreviations. These approaches are examined to elucidate their effectiveness in ensuring accurate and comprehensible communication across linguistic boundaries in aviation contexts.

RESLUTS AND DISCUSSION

In the history of aviation terminology, semantic shifts can be categorized into two main types: 1) changes driven by new discoveries, such as how the term "aeronaut," originally meaning a balloonist, evolved to signify a pilot with the advent of heavier-than-air vehicles and later an astronaut with spaceflight; 2) changes due to advancements in technology and objects themselves. For instance, "aeroplane" no longer refers to the simple wooden and canvas structures of the early 20th century but now denotes sophisticated, modern aircraft designs. This evolution reflects how the term's meaning has been enriched by real-world developments rather than abstract concepts [see: Arnold 1966].

The continuous evolution of a term's semantics raises questions about the definition of its "semantic structure," which encompasses all its lexical and semantic variations. While linguists discuss the preference for terms to be unambiguous (R. Budagov, K. Levkovskaya, D. Lotte, etc.), the presence of multiple meanings for a single term is not uncommon in English aviation terminology [Arnold 1944: 87-98]. For instance, the term "airborne" in English can refer to: 1) equipment installed on an aircraft; 2) being in the air; 3) transported by air; 4) related to aviation [Marasanov 1996: 19].

In the realm of terminology, there is ongoing debate regarding methods for forming terms. Various approaches to addressing this issue include: 1) employing native language words as terms, 2) adopting foreign words, and 3) utilizing Greek and Latin language elements and word-formation patterns (A. Reformatsky); 1) assigning new terminological meanings to existing words in the literary language, and 2) incorporating foreign language components (R. Budagov); 1) employing Greek and Latin linguistic forms, 2) borrowing from other terminological systems, 3) employing word-formation techniques such as compounding, semantic shifts, and derivation, and 4) adopting terms from other languages (I. Arnold).

An examination of English aviation terminology reveals that it primarily developed through borrowing from the French language and utilizing its own linguistic resources. Among the terms of French origin, which incorporate models and elements from Greek and Latin, notable examples include: aeroplane, aerobatics, aileron, avion, biplane,

fuselage, hangar, hydroplane, longeron, monoplane, nacelle, pique, quadriplane, and virage.

At the start of the twentieth century, English language development of aviation terminology intensified, driven by active aviation advancements in England and the USA. By this time, fundamental components of aircraft had been established, as evidenced by terms cataloged in A. Schloman's aviation dictionary (1910), including balancers, body, cabin, deck, fin, nose, spar, and tail [Shloman 1910]. Additionally, terms related to auxiliary equipment and aircraft maintenance began to emerge and gained widespread usage, such as aeroplane shed, aircrew, airfield, airman, and airway [Shloman 1910].

Modern English aviation terminology encompasses several distinct macro-categories. For instance, under "безопасность" (safety), terms include air safety (безопасность воздушного движения), factor of safety (коэффициент безопасности), and flight safety (безопасность полетов). "Планы/схемы полета" (flight plans/schemes) cover flight plan (план полета), aerodrome traffic circuit (схема полетов над аэродромом), and supplementary flight plan (дополнительный план полета). "Субъекты полета" (flight personnel) include pilot-in-command (командир воздушного судна (ВС)), radar controller (диспетчер радиолокационного контроля), and flight crew member (член экипажа). "Объекты полета" (flight objects) encompass aircraft (воздушное судно), helicopter (вертолет), and dirigible (дирижабль). "Базы/зоны полета" (flight bases/zones) include aerodrome (аэродром), taxiway (рулежная дорожка), and aerodrome traffic zone (зона аэродромного движения). "Время полета" (flight time) comprises flight time (время полета), instrument time (время полета по приборам), and take-off time (время взлета). "Сигналы" (signals) consist of secondary radar (вторичный радиолокатор), radar identification (радиолокационное опознавание), and surveillance radar (обзорный радиолокатор). "Условия полета" (flight conditions) cover conditions on the route (условия полета по заданному маршруту), visual meteorological conditions (визуальные метеорологические условия), and actual flight conditions (реальные условия полета). "Диспетчерское обслуживание полета" (flight dispatch services) involves flight controls (органы управления полетом), air traffic control clearance (разрешение диспетчерской службы), and aerodrome control tower (аэродромный диспетчерский пункт). "Полет ВС" (aircraft flight) includes take-off (взлет, отрыв от земли), level flight (горизонтальный полет), and upward flight (полет с набором высоты). "Фигуры пилотажа"

(aerobatics) encompass acrobatic flight (фигурный полет), roll («бочка»), and spin (штопор). "Конструкция ВС" (aircraft structure) involves fuselage (фюзеляж), wing tip (законцовка крыла), and aileron (элерон). "Двигатели ВС" (aircraft engines) comprise fan-type engine (турбовентиляторный двигатель), jet engine (реактивный двигатель), and piston engine (поршневой двигатель). "Приборы и системы ВС" (aircraft instruments and systems) include ice protection system (противообледенительная система), instrument panel (приборная доска), and hydraulic jack (гидроподъемник). "Поиск и спасение" (search and rescue) involves air search (поиск с воздуха), search and rescue region (район поиска и спасения), and rescue unit (спасательная команда). "Расследование авиационных происшествий" (aviation incident investigation) covers accident (авиационное происшествие), incident (инцидент), and investigation (расследование) [see: Yencheva 2011].

The primary methods of forming aviation terms in English include lexical-semantic, morphological, and lexical-synthetic approaches. Through lexical-semantic formation, the aviation terminology system incorporates units with revised meanings (such as "jacket" meaning both куртка and кожух, "jar" meaning кувшин and конденсатор, "to load" meaning нагружать and заряжать). Morphological formation enriches aviation terminology with derivative terms (e.g., bear-ing, circl-ing, control(l)-er, safe-ty). Compounding contributes complex terms (like accident-free, air-craft, auto-throttle, gyroplane). Specific to English is the use of prepositions in terms (e.g., leveling-off, check-in, circle-to-land, lock-on, noising-over, take-off). Lexical-synthetic formation creates two- and multi-component combinations (such as radio communication equipment, snow clearing equipment). Some terms emerge from a combination of these methods.

An analysis of English aviation terminology reveals a mix of single-component and multi-component units, alongside numerous abbreviations and acronyms. Single-component terms were particularly prominent from the era of early hot air balloon flights through the use of airplanes in World War I, marking the foundational period of aviation terminology development.

Among single-component aviation terms, nouns, adjectives, and verbs predominate. The primary patterns for forming substantive aviation terms include: N Stem (e.g., backet – лопатка (газотурбинного двигателя)); V+-er (e.g., charterer – фрахтовщик); V+-or (e.g., navigator – штурман); V+-ing (e.g., landing –

приземление); V+-ation (e.g., embarkation – посадка (пассажиров)); N+-ship (e.g., airmanship – летное мастерство); over-+N (e.g., overloading – перегрузка); N+N (e.g., airline – авиакомпания); V+Adv (e.g., touchdown – касание ВПП) and so on.

The most common adjectival aviation terms follow these patterns: AdjStem (e.g., dorsal – верхнефюзеляжный); V+-al (e.g., aerodynamical – аэродинамический); N+-less (e.g., pilotless – беспилотный); V+-able (e.g., dirigible – управляемый (об аэростате)); anti-+Adj (e.g., anti-aircraft – противовоздушный); un-+Adj (e.g., unmanned – беспилотный); multi-+Adj (e.g., multiblade – многолопастный) and others.

English monolexemic verb terms are structured as follows: VStem (e.g., sail – парить в воздухе); N+-ate (e.g., rotate – вращаться); N+-ize (e.g., localize – определять местонахождение); over-+V (e.g., overshoot – перелет (при посадке)); un-+V (e.g., unfeather – расфлюгировать (воздушный винт)); under-+V (e.g., undershoot – недолетать (к торцу ВПП)); re-+V (e.g., re-entry – возвращаться в плотные слои атмосферы) and so forth.

The majority of aviation terms in English are composed of multiple components. According to G. Vinokur, two-component terms help organize terminology systems by using one component shared with other terms, while the other serves to distinguish concepts within related contexts [Vinokur 1939: 38]. E. Tolikina suggests that compound terms are formed due to a tendency towards semantic and paradigmatic regularity, aiming to depict both generic and specific relationships [Tolikina 1970: 65]. Considering these perspectives, it is evident that in modern, dynamic English aviation terminology, compound terms (including two-component and polynomial terms) are often more advantageous than single-word terms. They facilitate clearer delineation of relationships between concepts during system development, as illustrated by examples from aviation terminology.

Let's analyze the main models of multi-component English aviation terms and ways of reproducing them in Russian.

N1+N2 model terms

Complex terms constructed following the N1+N2 model (noun + noun) typically appear in the following forms: 1) a structure where N2 in Russian functions as a genitive case noun with a postpositive definition to N1: airplane structure – конструкция самолета; control valve – клапан управления. 2) a term where N1 corresponds to an adjective: air navigation – воздушное движение; air throttle – дроссельный клапан.

3) a term where in Russian, N1 transforms into a prepositional noun phrase: load controller – диспетчер по загрузке. 4) a term where N1 transforms into a phrase directly corresponding to N2: fine wire – провод малого сечения.

Model terms (N+Part. I)+N

The second component of these complex terms (N is a noun) is translated into Russian by a noun, and the first component (N+Part. I, where Part. I is a present participle) is translated mainly as follows: 1) a simple adjective based on the corresponding English noun or present participle: planeboarding – посадочный; 2) complex adjective: aluminium-smelting – алюминиеплавильный; 3) complex participle: air-retaining – воздухонепроницаемый, воздухоудерживающий.

Model terms (N+Part. II)+N

The second component (N is a noun) of these terms is translated into Russian by a noun, and the first component (N + Part. II, where Part. II is the past participle) is mainly translated in the following ways: 1) a qualifying phrase in which the English participle corresponds in Russian to an adjective or participle: air-cooled – охлаждаемый воздухом; 2) a qualifying prepositional noun phrase: air-braked - с аэродинамическим торможением; 3) participle or participial phrase: carrier-based – базирующийся на авианосце.

Model terms (Adj.+Part. I)+N

The second part of such terms (N - noun) is translated into Russian by a noun, and the first part (Adj. + Part. I - a combination of an adjective and a present participle) is mainly translated as follows: 1) a complex adjective consisting of two stems: quickacting – быстродействующий; 2) a simple adjective: long-standing – длительныйю; 3) a qualifying prepositional noun phrase: air-bearing – на аэростатических опорах, на воздушной подушке; 4) translation with attributive phrases: short-acting – быстрого действия.

Model terms (Adj.+Part. II)+N

The second component of such terms (N - noun) is translated into Russian by a noun, and the first - (Adj. + Part. II - a combination of an adjective and a past participle) mainly in the following ways: 1) simple adjective or participle: short-cut – укороченный; 2) complex adjective: double-sided valve – двухсторонний клапан; 3) a defining phrase in which the correspondence to the English past participle is an adjective or participle, and to the English adjective is a noun or adverb: short-circuited – замкнутый накоротко.

Model terms (Num.+Part. II)+N

The second component (N – noun) of such terms is translated into Russian as a noun, and the first (Num.+Part. II – combination of numeral and past participle) – mainly in the following ways: 1) сложным прилагательным, состоящим из основ числительного и прилагательного: four-sided –четырехсторонний; 2) a qualifying prepositional noun phrase: ten-sided – с десятью гранями.

An examination of multi-component English aviation terms reveals that the most prevalent structure is the N1+N2 model. In Russian, this model is primarily represented by combining a noun with another noun in the genitive case, serving as a postpositive definition, or by combining an adjective with a noun.

A significant number of abbreviations in the aviation industry necessitates clear rules for their adaptation into Russian. These rules include:

1. **Translation with Equivalent Abbreviation:** Direct translation when an equivalent exists in the target language, e.g., ACFT (aircraft) → VS (воздушное судно), ACC (area control center) → RDC (районный диспетчерский центр).
2. **Translation of Full Form:** When no direct equivalent exists, translating the full form of the abbreviation, e.g., GA (general aviation) → гражданская авиация, DUR (duration) → продолжительность.
3. **Transcoding:** Using transcription or transliteration when necessary, e.g., AEROSAT (Aeronautical Satellite Council) → АЭРОСАТ (Совет авиационных спутников), AFIL (air-filed flight plan) → АФИЛ (план полета, передаваемый с борта).
4. **Tracing of Original Form:** Retaining the original form of the abbreviation when it represents a specific entity, e.g., TAIL (tail wind) → хвостовой ветер, STAR (standard terminal arrival route) → стандартный маршрут прибытия.
5. **Descriptive Translation:** Providing a descriptive translation to convey the technical essence when no direct equivalent exists, e.g., RUT (standard radio transmission frequencies for regional routes) → стандартные радиочастоты для региональных маршрутов.
6. **Creation of New Abbreviations:** Introducing new abbreviations in the target language, e.g., RWY (runway) → ВПП (взлетно-посадочная полоса), VFR (visual flight rules) → ВПП (визуальные правила полета).
7. **Direct Borrowing:** Directly borrowing aircraft brands, engines, and equipment names, e.g., B737-200, ATR-42, RTM322, JT15D-4, AN/AC182.

These methods ensure accurate and standardized adaptation of aviation abbreviations into Russian.

CONCLUSION

In conclusion, the adaptation of aviation abbreviations into Russian involves a systematic approach to ensure clarity, consistency, and accuracy in communication within the aviation industry. The diverse methods discussed, including direct translation with equivalents, transliteration, and descriptive translations, serve to bridge linguistic gaps and facilitate effective cross-cultural communication. Each method is tailored to meet specific linguistic challenges, whether it involves finding equivalent terms, transliterating technical jargon, or creating new abbreviations where necessary. By adhering to these principles, aviation professionals can ensure precise understanding and seamless operational coordination across linguistic boundaries. This research highlights the importance of standardized practices in aviation terminology adaptation, emphasizing the role of clear communication in enhancing safety, efficiency, and collaboration in the global aviation sector.

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