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TRANSLATION TRANSFORMATIONS IN ENGLISH-UKRAINIAN RENDERING OF CBRN TERMINOLOGY

An analysis of authentic texts in the field of chemical, biological, radiological, and nuclear (CBRN) defense – specifically instructions, protocols, and regulatory standards – shows that literal translation is not always adequate for conveying specialized information. In today's Ukrainian context, the accuracy of such translations takes on strategic importance, as Ukraine's active integration into Euro-Atlantic security structures requires the full unification and harmonization of the Ukrainian military-technical terminology with international standards, in particular the NATO Standardization Agreement (STANAG).

Formal correspondence to the source text may be accompanied by a breach of professional discourse standards or a shift in the semantic focus of a term – a phenomenon that is particularly critical for texts demanding a high level of terminological precision. This translation challenge stems from significant cross-linguistic asymmetry between the English and Ukrainian professional worldviews in the military and security spheres, rendering literal translation ineffective. Therefore, the aim of our study is to identify and systematize key translation transformations that serve as the primary tool for overcoming this asymmetry and ensure the adequate English-Ukrainian rendering of CBRN terminology.

The theoretical framework of this study draws upon Eugene Nida's classic distinction between formal correspondence and dynamic equivalence. In the realm of CBRN defense, prioritizing strict formal correspondence often distorts professional discourse standards. Therefore, achieving dynamic equivalence requires a flexible approach, where translation transformations help ensure accuracy in the target text.

The empirical data for this study consists of a selection of terminological units identified through targeted sampling from authoritative international documents in the field of CBRN safety. The primary data sources are the NATO Glossary on CBRN Issues (2021), the FEMA Glossary of Terms (2021), European Commission documentation on CBRN risk mitigation (2020), and selected reports from the NATO Science for Peace and Security Program (2021). The methodological framework is based on contrastive and translation analyses to assess how original English terms are rendered into Ukrainian equivalents, identifying specific lexical, grammatical, and mixed transformations used to bridge cross-linguistic gaps.

To analyze the English-Ukrainian rendering of CBRN terminology systematically, the identified translation shifts are categorized into three major typological groups: lexical

(semantic), grammatical, and mixed (combined) transformations according to the foundational models established by J.-P. Vinay, J. Darbelnet, and V. Karaban, which include:

Lexical transformations (such as loan translation/calquing, concretization, or generalization) primarily address semantic non-equivalence, modifying the internal semantic structure of a term to align with Ukrainian terminological standards.

Grammatical transformations (including part-of-speech substitutions, word order rearrangements, or structural inner-sentence changes) are determined by morphological and syntactic differences between the two languages, leading to changes in formal structures without altering the underlying meaning.

Mixed transformations (descriptive translation/explication and antonymous translation) operate simultaneously on both levels; they serve as a vital adaptive mechanism for rendering completely non-equivalent or context-dependent CBRN concepts that lack direct lexical matches in the target language.

For this study, a sample of 20 key terminological units was selected to illustrate how these three categories function in practice. Representing the most complex and frequently occurring terms in the source documentation, these units are distributed and summarized in the table 1 below.

Table 1

No.	Type of transformation	Number of examples	Percentage (%)
1	Loan translation (calquing)	8	40%
2	Direct equivalent translation	4	20%
3	Descriptive translation (explication)	3	15%
4	Transliteration/transposition	2	10%
5	Concretization	1	5%
6	Generalization	1	5%
7	Combined (mixed) transformations	1	5%
Total	Core analyzed units	20	100%

The example of “*Toxic Industrial Materials (TIMs)*” (NATO CBRN Glossary, 2021), translated as «*токсичні промислові речовини (ТПР)*», shows that while the multi-word structure is kept, the noun “*materials*” is changed to «*речовини*» to match established Ukrainian military-chemical terminology.

As seen in the case of “*chemical weapon*” (NATO CBRN Glossary, 2021), rendered as «*хімічна зброя*» into Ukrainian, a direct word-for-word calque both the adjective and the noun are translated sequentially, ensuring an absolute conceptual match that has been standard in military discourse for decades.

The translation of “*CBRN risk mitigation*” (European Commission, 2020), as «*зниження ризиків РХБЗ*», illustrates how calquing is combined with a minor grammatical adjustment, where the English noun chain is mirrored but rearranged to fit natural Ukrainian grammar.

The translation of “*shelter-in-place*” (FEMA, 2021) as «*надання укриття за місцем перебування*» illustrates how an English verbal safety protocol must be expanded into a descriptive noun phrase to convey its operational meaning.

Another illustrative case is found in *“first responders”* (FEMA, 2021), translated as *«фахівці першої лінії реагування»*, which shows how a lack of a single-word equivalent forces the translator to explain the term based on its functional role.

When rendering *“radioactive fallout”* (FEMA, 2021) into Ukrainian as *«радіоактивні опади»*, the translator applies grammatical transposition, changing the English uncountable singular noun into a standard Ukrainian plural form.

The example of *“syndrome”* (NATO CBRN Glossary, 2021), transliterated into Ukrainian as *«синдром»* (e.g., in medical CBRN defense), shows how phonetic borrowing is used to directly adapt standardized international medical terms into the target register.

A clear demonstration of concretization is represented by the English example *“chemical agent”* (NATO CBRN Glossary, 2021), translated as *«отруйна речовина (ОР)»*, where the broad and abstract English noun *“agent”* is narrowed down to match specific military terminology.

The textbook example of *“blister agent”* (NATO CBRN Glossary, 2021), rendered as *«речовина шкірно-наривної дії»*, proves that a highly specific English term *“blister”* is sometimes generalized into a broader category based on its overall physiological effect.

Finally, the analysis of *“CBRN defense capabilities”* (European Commission, 2020), translated as *«потенціал захисту від ПХБЗ загроз»*, reveals the simultaneous use of multiple changes, combining acronym calquing with word order rearrangement and lexical replacement.

The translation of contemporary English CBRN terminology into Ukrainian requires a flexible systemic approach to overcome structural and conceptual asymmetries. The quantitative analysis revealed that loan translation (calquing) is the most dominant method (40%), which is driven by the strict requirements for international interoperability and alignment with NATO STANAG standards. At the same time, translation shifts like descriptive translation (15 %) and combined transformations (5 %) prove essential for rendering non-equivalent protocols and complex noun-adjunct chains accurately. Ultimately, successful translation depends on balancing word-for-word accuracy with the changes needed to match established Ukrainian military terminology.

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