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TRANSLATION STRATEGIES FOR ENGLISH NEOLOGISMS IN THE FIELD OF RADIOLOGICAL SAFETY

The rapid development of nuclear technologies, together with the emergence of complex global risks, has led to significant changes in the terminology used in the field of radiological safety. As the discipline adapts to modern digital and hybrid security paradigms, its lexical system is constantly evolving. This process is particularly evident in the emergence of neologisms – linguistic units that denote innovative security protocols, advanced monitoring systems, and integrated response mechanisms. The IAEA Safety Glossary (2022 edition) [2] serves as an important scientific and regulatory source that reflects these changes by institutionalizing newly introduced terms which represent both technological progress and the advancement of international safety standards.

Within the Ukrainian linguistic context, the integration of these terminological innovations poses a significant challenge. Many of the newly introduced concepts lack standardized or widely accepted Ukrainian equivalents**,** which complicates their consistent use in professional communication and regulatory documentation. Therefore, the translation of such neologisms requires more than simple lexical replacement. It involves terminological standardization, conceptual clarification, and careful adaptation in accordance with the norms of Ukrainian scientific discourse [3]. Ensuring semantic accuracy while maintaining clarity and functional adequacy remains a key issue in adapting modern radiological safety terminology to the Ukrainian language.

Effectively rendering neologisms in radiological safety demands a systematic approach that considers both linguistic structure and communicative function. From the point of view of translation studies, the rendering of such units is carried out according to the principle of communicative equivalence [1], where priority is given to preserving the functional value of the term in the target professional discourse. For the purposes of this analysis, the terminological innovations identified in the IAEA Safety Glossary (2022) [2] were grouped into several thematic clusters, allowing us to determine correlations between the semantic characteristics of a term and the most appropriate translation strategy.

The first group of our research incorporates **technological and operational neologisms**, which describe innovative hardware, sensors, and deployment systems within the modern radiological monitoring infrastructure. These units are characterized by high semantic density and often integrate terms from adjacent fields such as robotics and remote sensing. For instance, the term *"stand-off detection"* – defined by the IAEA [2] as the measurement of radiation at a distance without physical contact – presents a specific challenge for the Ukrainian translator. While a literal rendering might be *«дистанційне виявлення»*, it fails to capture the tactical nuance of "stand-off", which implies maintaining a safe operational margin. Therefore, we argue that **descriptive translation (explication)** is the most effective strategy here, resulting in the Ukrainian equivalent *«дистанційне виявлення з дотриманням безпечної дистанції»* or

«безконтактна детекція», which maintains the operational safety implications of the original term.

Additionally, this cluster includes terms such as *"unmanned aerial monitoring systems" (UAMS)* and *"mobile monitoring units" (MMU).* For these units, the strategy of calquing (loan translation) is the preferred approach [3]. Rendering these as *«безпілотні авіаційні системи моніторингу»* and *«мобільні підрозділи моніторингу»* ensures precise terminological alignment between international protocols and the national regulatory framework of the State Emergency Service of Ukraine. The preference for calquing in this instance is determined by the need for structural transparency, ensuring that each component of the English compound is accurately reflected in the target language to avoid ambiguity during joint international response operations.

The second cluster focuses on methodological neologisms related to risk assessment and predictive modeling. Unlike technical hardware terms, these concepts are more abstract and process-oriented, necessitating a shift toward **semantic modulation** and **functional adaptation** [1]. An illustrative example is the term *"source term estimation",* which refers to the quantification of radioactive material released during an incident [2]. In Ukrainian, the term "term" requires careful modulation to ***«параметри джерела викиду»*** or ***«характеристики вихідного викиду»***, as a literal translation would be semantically obscure to practitioners in the field of civil protection.

The third cluster focuses on neologisms related to **consequence management**, encompassing the strategic and tactical measures designed to mitigate the impact of radiological or nuclear emergencies on public health and the environment. Unlike technical monitoring, this domain operates with complex, action-oriented concepts that prioritize functional adequacy and immediate clarity in high-pressure scenarios. A primary example is the term *"sheltering in place",* which the IAEA defines as a protective action involving staying inside a building to reduce exposure to airborne contaminants [2]. In the Ukrainian regulatory framework, a direct translation such as *«укриття на місці»* is often insufficient; thus, **descriptive translation** and **contextual adaptation** are employed to render it as *«перебування в укриттях за місцем знаходження»* or *«самоізоляція в приміщеннях»*. Similarly, the neologism *"urgent protective action"* reflects a shift toward proactive intervention. While it is often translated via **calquing** as *«термінові захисні заходи»*, the translator must apply **terminological specification** to ensure that "urgent" is not conflated with "emergency" (*аварійний*), thereby preserving the IAEA's emphasis on time-critical effectiveness to prevent deterministic effects. Furthermore, the term *"remedial action",* which refers to environmental interventions like soil or water treatment [2], necessitates **semantic modulation**. Instead of literal equivalents like *«лікувальний»*, the most appropriate Ukrainian translation is *«відновлювальні заходи»* or *«заходи з ліквідації наслідків забруднення»*, aligning the English concept with the technical and ecological discourse of the Ukrainian civil protection sector.

An analysis of neologisms in the IAEA's "Security Glossary" (2022) [2] shows that the evolution of radiation safety terminology is inseparably linked to the introduction of high-tech monitoring tools and proactive risk management. The choice of translation strategy is primarily determined by the semantic nature of the term:

Calque translation [3] proves most effective for technological and hardware neologisms, where structural transparency is essential for international cooperation.

Descriptive translation and semantic modulation [1] are indispensable for methodological and operational concepts, where maintaining functional adequacy in the context of Ukraine's civil protection takes priority over literal accuracy.

The study emphasizes that the successful adaptation of these terms into the Ukrainian language is not only a linguistic task but also a strategic necessity. Proper terminological harmonization ensures the compatibility of national emergency response protocols with international standards, thereby enhancing the overall effectiveness of civil protection measures in the context of modern radiation threats.

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