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«Mobile application TRACE as a tool for improving the efficiency of customs control of fissile and radioactive materials»

Research Field:
«Modern technologies in international trade»

Today, the problem of illicit trafficking in fissile and radioactive materials (hereinafter referred to as FRM) is a global threat to the security of the entire world community. According to information contained in the IAEA Incidents and Trafficking Database over the past 25 years, more than 3,500 incidents with FRM have been officially registered in the world, about 10 % of which are related to their illegal movement. At the same time, according to the organization's experts, this figure is only 2–5 % of the total number of unregistered cases[1].

In response to the ever-increasing threat of illicit trafficking in FRM, as well as to reduce the risks of nuclear terrorism, more than 10,000 radiation portal monitors have been installed at checkpoints around the world to continuously monitor the contents of trucks, cars, air cargo and containers and record hundreds of thousands of alarms annually. Proper assessment of such alarms is an essential part of the process of organizing the customs control of the FRM, since further actions of customs officials and the effectiveness of the radiation control measures depend on the reliability of the classification of the received alarm signal.

The inspection of vehicles for illegal FRM should be carried out as soon as possible and with absolute accuracy. Balancing these two requirements is inevitably difficult, since, due to the high sensitivity of the radiation portal monitors to detect even small amounts of FRM, most of the detected alarms at the borders (more than 99 %) are non-disturbance (safe) alarms resulting from the presence of medical radionuclides, natural radioactive materials (hereinafter referred to as NORM), and legitimate supplies of FRM[2].

Owing to the considerable amount of information and its constant updating, officials have limited knowledge of radioactive materials, and agencies do not have the ability to quickly issue relevant manuals. In turn, the lack of quick access to information on why the goods being moved

[1] База данных по инцидентам и незаконному обороту. 25 лет борьбы с незаконным оборотом радиоактивных материалов [Электронный ресурс] / Международное агентство по атомной энергии. – Режим доступа : https://www.iaea.org/newscenter/news/iaea-launches-mobile-application-tool-for-radiation-alarm-and-commodity-evaluation. – Дата доступа : 14.05.2021.
[2] Improved Assessment of Initial Alarms from Radiation Detection Instruments [Electronic resource] / International Atomic Energy Agency. – Mode of access : https://www.iaea.org/projects/crp/j02005. – Date of access : 14.05.2021.

cause an actuation of radiation control systems and whether the presence of an identified radionuclide in it is legitimate complicates the work of customs authorities and increases the time for making decisions on further actions.

Given the high frequency of alarms and the many responsibilities of customs officials in responding to them, there is a need to create a tool for more effective alarm assessment.

To solve this problem, the IAEA developed the Tool for Radiation Alarm and Commodity Evaluation (hereinafter referred to as TRACE) as part of a coordinated research project involving experts from more than 20 countries.

This application provides an extensive list of goods containing NORM and their typical radiation characteristics, the purpose of which is to assist customs authorities in deciding whether radiation alarms are caused at checkpoints by natural radioactive material or indicate contraband material that requires further inspection (Figure 1).

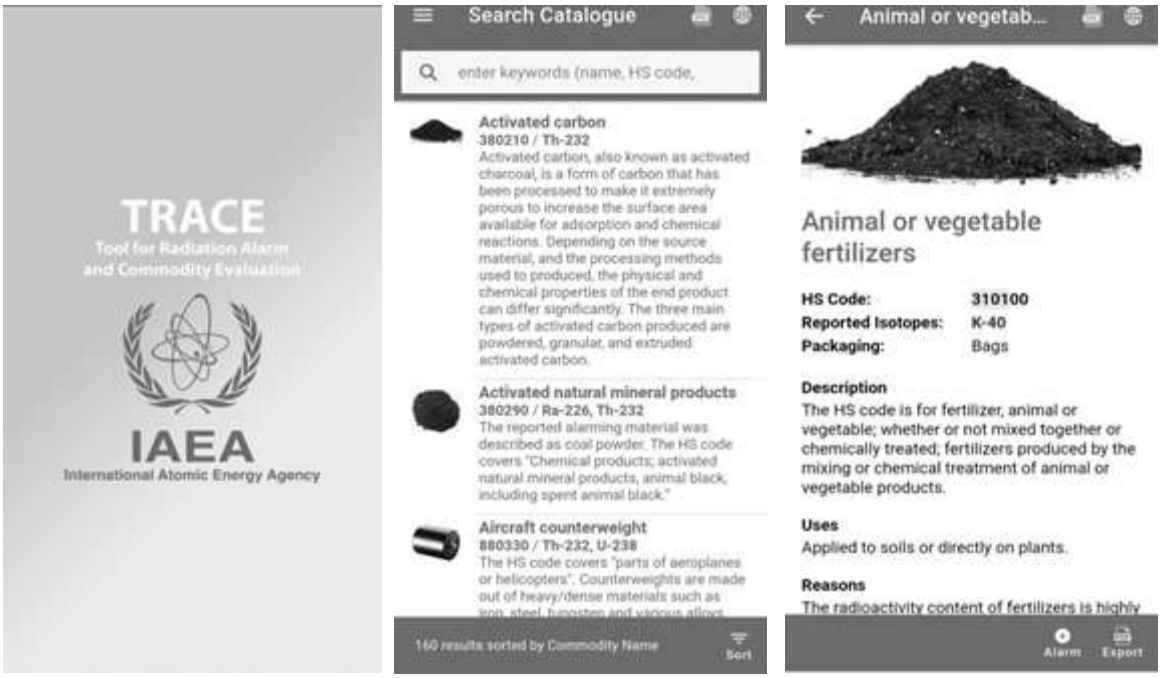

Figure 1 – Mobile Application TRACE

Footnote – Source: own elaboration of the author.

So, for example, if the accompanying documents indicate that the product for which the radiation control system was triggered is ceramic dishes, the operator uses the application to determine that natural thorium (Th-232) should be present in it. However, if a spectrum of cobalt (Co-60) is detected during the scanning of this product with the help of portable radiation monitoring devices, this fact may indicate an illegal movement of this ionizing radiation source and will require appropriate measures to detect and localize it.

Currently, TRACE is available in all the official languages of the IAEA (including Russian), and many countries and international organizations, such as the World Customs Organization, have incorporated TRACE into their standard operational procedures for alarm response and training customs and border officials.

The results of the application of this tool in foreign countries indicate a positive economic effect in the organization of customs control of the FRM. For example, experts in Sri Lanka note that the use of the application in the port of Colombo, which is the largest and busiest in the country, led to a reduction in time and effort to assess radiation alarms by 33 %. More detailed results of the implementation of TRACE in the process of customs control of the FRM at the port of Colombo are presented in Figure 2.

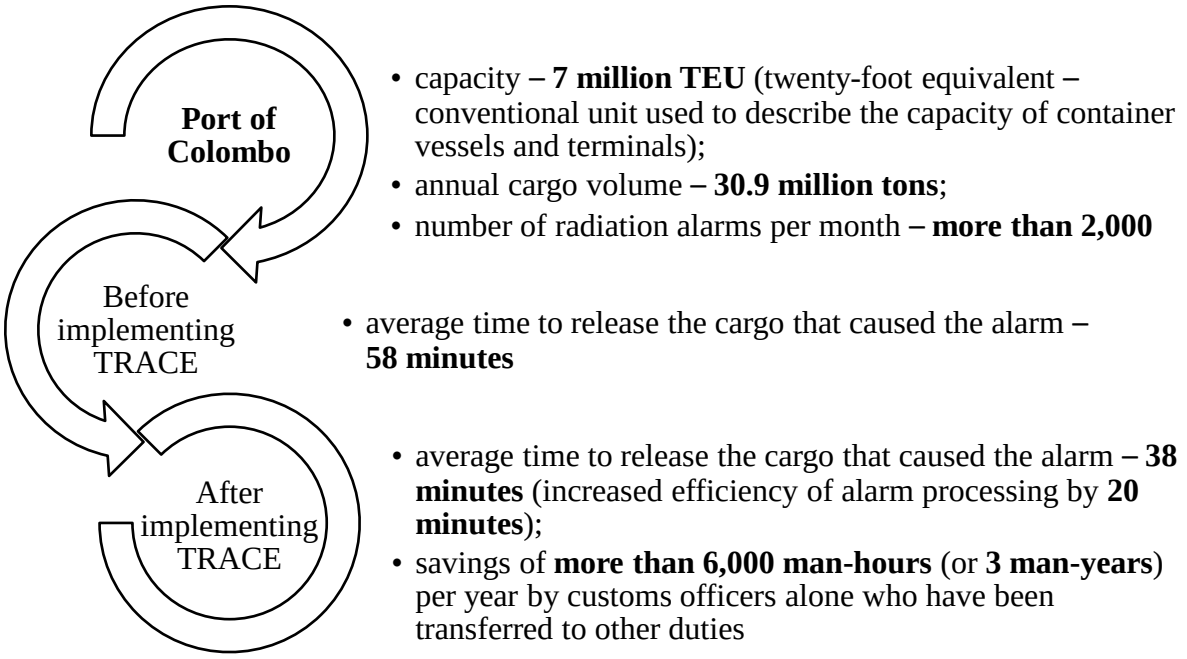

Figure 2 – Results of the TRACE application in the Port of Colombo

Footnote – Source: own elaboration of the author with [1].

In connection with the six-month rotation of customs officers, Sri Lanka has introduced training programmes for officials on radiation control using TRACE and is currently conducting its own training programmes[2].

[1] Material Out of Regulatory Control: Facilitating Trade While Preventing Nuclear Smuggling [Electronic resource] / Vienna Center for Disarmament and Non-Proliferation. – Mode of access : https://vcdnp.org/wp-content/uploads/2020/01/MORC-Report_Final.pdf. – Date of access : 14.05.2021.

[2] Helping Trade while Keeping Sri Lanka Secure: the IAEA's Tool for Radiation Alarm and Commodity Evaluation (TRACE) [Electronic resource] / International Atomic Energy Agency. – Mode of access : https://www.iaea.org/newscenter/multimedia/photoessays/helping-trade-while-keeping-sri-lanka-secure-the-iaeas-tool-for-radiation-alarm-and-commodity-evaluation-trace. – Date of access : 14.05.2021.

Thus, the advantages of using TRACE in the organization of customs control of FRM are as follows:

- ease of implementation and use of the application by customs officials;
- no need for structural and technological reforms in existing radiation control systems;
- provides customs authorities with complete, reliable, timely and up-to-date information on the assessment and identification of ionizing radiation sources;
- the ability to quickly and accurately assess the radiation alarm signal to officials and establish the legality of moving the ionizing radiation sources across the border.

For example, the experience of Sri Lanka shows that the use of TRACE makes it possible to identify, more quickly and qualitatively, radiation alarms caused by harmless amounts of natural radiation and alarms that require further investigation and cause safety concerns, avoiding unnecessary vehicle inspections and delays. This allows most safe alarms to be filtered and the customs authorities to focus on detecting the illegal movement and smuggling of hazardous materials.

As a result, the time and labor costs of the customs authorities are significantly reduced, the influence of the subjective (human) factor is reduced, and it becomes possible to redistribute the released labor resources to other areas of the customs authorities' activities, which ultimately leads to an increase in the effectiveness of the customs control of the FRM and the acceleration of legitimate foreign trade, while ensuring the radiation safety of the state.

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«The improvement of the product certification system in the Republic of Belarus in the field of safe business environment»

Research direction:
A safe business environment for economic development

This article provides an analysis of the conditions for the product certification implementation in the Republic of Belarus. The author aims to identify problems and suggest ways to improve approaches to product certification in the Republic of Belarus.

At the present stage of the development of international trade relations between the Republic of Belarus and foreign countries there is a tendency to reduce technical barriers in trade in order to create favorable business conditions. The topicality of the research is relevant to the