



PREVENTION OF ILLICIT TRAFFICKING OF NUCLEAR MATERIAL AND RADIOACTIVE SOURCES

N. KRAVCHENKO

Directorate of Special Technique and Automation of Customs Technologies State Customs Committee of the Russian Federation Moscow, Russian Federation

Countries like Russia, which have a large nuclear industry, export a significant number of radioactive sources and substances. Some of them are nuclear material. In general, it is the task of the customs inspectors to verify that the content of the shipment is in agreement with the declaration (as safeguards inspectors verify operators declarations). In case of other goods, this is easy. The consignment can be opened and the content can be seen and compared with the declaration. In the case of radioactive shipments this cannot be done. The radioactive substance is in a shielded container and opening is often only possible in a hot cell. Opening of the package and measurement of the removed source in presence of the customs inspector is impossible because the customs control begins only after the declaration has been registered. Therefore, the Russian customs authorities have contracted a company to develop a gamma spectrometer, which can be used to verify the source, even if inside the shielded shipping container. Throughout the country - near the where many shipments or receivables take place - there are 18 customs offices, equipped with gamma spectrometers and special software. If a container arrives for customs inspection, its design is called from a database. Then the gamma spectrum outside the container is measured and the measured gamma peak energy and intensity is compared with the expected, which is calculated by software based on the design information of the container. This approach works well. Several cases were already discovered in Russia, where there were attempts to use legal shipments for smuggling radioactive sources.

I would like to mention some technical problems concerning control of legal export and import of radioactive sources:

a) There are not enough commercial suppliers, which offer the needed equipment; because of lack of competition prices for the equipment are too high

b) Presently available equipment is mainly based on HPGE cooled with liquid nitrogen.

Therefore, it is difficult to use in customs offices. Alternative detector options, which do not require liquid nitrogen cooling, should be explored

c) Verification of legal shipments is presently only done in Russia, to extent it worldwide an international data base containing design information of all shipment containers would be required; this is also important for the receiving country to verify arriving shipments. The database must allow integration into available measurement and verification software

d) Presently no procedures for test, validation and certification of methods to verify legal shipments are available, therefore in Russia such measurements can only be used in court if combined with an additional investigation, requiring opening of the container. This is expensive and there is a strong desire to use measurement results directly to initiate a court order

e) Even if verification measurements are made, they can be faked when the thickness of the container is altered. Presently no generic methods are implemented which allow the verification of the container design

Actuality of these problems can be confirmed by the real cases of smuggling disclosure, some of which I am going to adduce.

In view of the above it would be desirable that the International organizations, such as IAEA, WCO and others, would provide assistance to National Customs Services. The State Customs Committee of the Russian Federation is willing to cooperate with any International organizations and National Customs Services in this area.