

# Training Options for Countering Nuclear Smuggling

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# TRAINING OPTIONS FOR COUNTERING NUCLEAR SMUGGLING

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## Abstract

The burden of stopping a nuclear smuggling attempt at the border rests most heavily on the front-line customs inspector. He needs to know how to use the technological tools at his disposal, how to discern tell-tale anomalies in export documents and manifests, how to notice psychological signs of a smuggler's tension, and how to search anything that might hide nuclear material. This means that assistance in the counter-nuclear smuggling training of customs officers is one of the most critical areas of help that the United States can provide. This paper discusses the various modes of specialized training, both in the field and in courses, as well as the types of assistance that can be provided. Training for nuclear customs specialists, and supervisors and managers of nuclear smuggling detection systems is also important, and differs from front-line inspector training in several aspects. The limitations of training and technological tools such as expert centers that will overcome these limitations are also discussed. Training assistance planned by DOE/NN-43 to Russia within the Second Line of Defense program is discussed in the light of these options, and future possibilities for such training are projected.

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## Introduction

Preventing the theft of weapons-usable highly enriched uranium and plutonium in Russia is one of the central security concerns facing the US today. The dissolution of the highly centralized USSR and the resulting societal crisis has endangered Russia's ability to protect its more than 200 metric tons of plutonium and 1000 tons of highly enriched uranium (roughly 8 kg Pu or 25 kg HEU is sufficient to make a bomb). Producing this fissile material is the most difficult and expensive part of nuclear weapons production and the US must make every effort to ensure that fissile material (and nuclear-related technologies) does not reach the hands of terrorist groups, rogue states or other potential proliferators.

In response to this concern, last year the Department of Energy (DOE) initiated a new program called the Second Line of Defense (SLD), the goal of which is to assist Russia in preventing the smuggling of nuclear material and weapons at its borders, either by land, sea or air. This program complements the Material Protection, Control and Accounting Program (MPC&A), which was begun in 1993 to prevent the theft of nuclear materials from Russian civilian complexes, and is considered the "first line of defense" against theft of nuclear material because its goal is to prevent the theft of material from the production and storage facilities themselves.

The SLD program represents an important phase in the overall effort to ensure the security of nuclear material and weapons in Russia. However, as the US engages Russian customs officials in this important project, it is important to keep in mind that providing equipment--even indigenous equipment--is insufficient by itself; purchasing equipment without providing proper training in the

use of that equipment will not be an effective mechanism for preventing the smuggling of nuclear materials or weapons across Russia's borders.

Toward this end, the Second Line of Defense program has designed a training curricula enhancement project in conjunction with the Russian Federation State Customs Committee (RF SCC). The curricula project is the cornerstone of the assistance provided to the RF SCC on training. This project, in turn, is supported by both a training equipment project as well as a multimedia technology project. Both are designed to enhance the training facilities and the border posts of the RF SCC. As the program evolves, the goal is to help establish a center of expertise that will provide information about nuclear materials and dual-use items to inspectors in the field. Prior to discussing the training plan, a brief overview of Russian Customs is warranted to better understand the environment in which Customs is operating and the personnel for whom the training primarily is intended.

## **Background**

Russian Customs has been in existence for only seven years. Its task is enormous: Customs must protect a State that borders 14 other countries. No country in the world borders as many states as Russia. Russian Customs is central to the nation's welfare because it provides between 25-40% of its revenues. RFSCC has a work force of more than 50,000 people.

The Regional Information and Technical Customs Department (RITTY) within Customs is responsible for nuclear detection. This department has achieved a great deal in a short time. Course syllabi have been developed for the various levels of Customs officials and training courses for Customs inspectors have been implemented.

The SLD Program has worked closely with RITTY to enhance their on-going projects in this area and to accelerate the deployment of equipment by helping fund its purchases. The cooperative training effort was begun in 1999.

## **Russian Customs Personnel**

Russian Customs hires employees with various educational backgrounds and these new hires are placed into either an Inspector or Officer level track. Training, therefore, must be diverse to address the different educational backgrounds and jobs of Customs personnel. Several types of employees are directly involved in nuclear smuggling and export control: the inspector, senior inspector and technical specialist (see figure 1).

### **Inspector**

The Customs inspector works at border crossings or at a customs warehouse, located in a nearby city, where goods are cleared for shipment. An inspector can be hired at the lowest entry-level position with only a high-school education. This front-line inspector has an enormous responsibility for he makes the final decision as to whether an item is allowed to cross the border. These inspectors must therefore be properly trained in the use of nuclear detectors. These new hires go to a

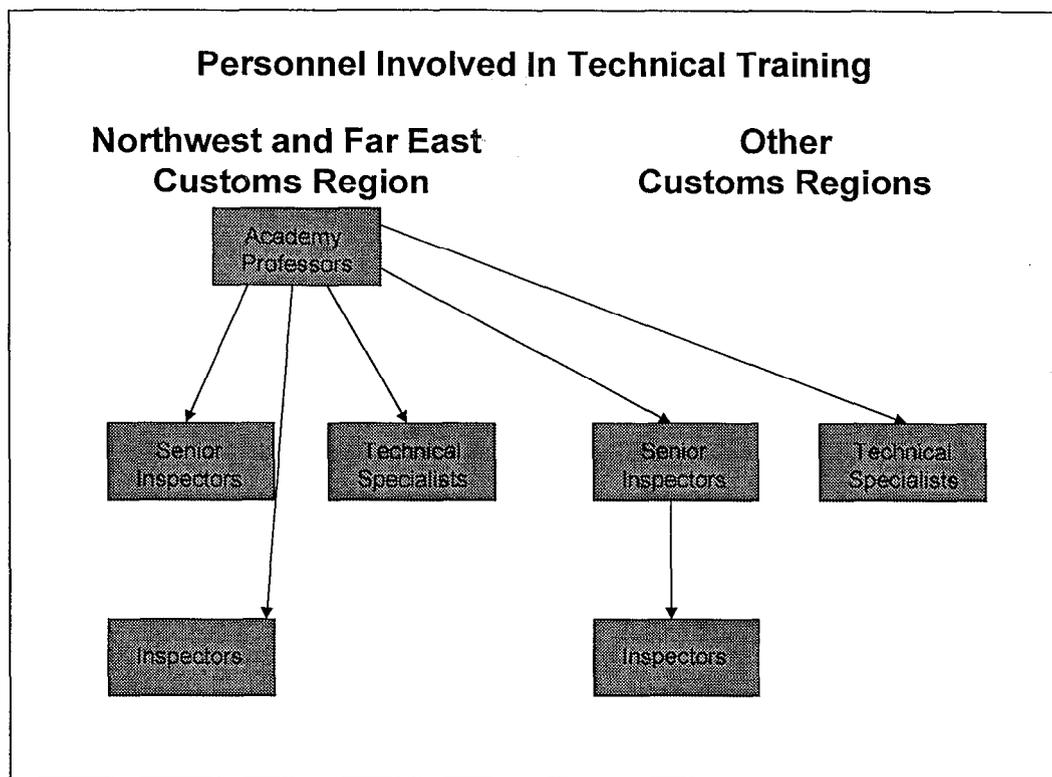
several week training class before they become accredited Customs inspectors. This training is generally carried out at one of the Customs offices that are located in each of the 13 Customs regions. Four of these regions (St. Petersburg, Moscow, Rostov, and Vladivostok) have a college-level training academy that trains technical specialists (see below for more on this), but the academies may also serve as a professional development institute for inspectors. It is believed that inspector-level training takes place at the training academies in these regions rather than the regional offices. Russian Customs has recently inaugurated a two-week nuclear detection class that is given once a new hire receives general customs training and becomes an inspector.

### **Senior Inspector**

The senior inspector supervises front-line inspectors and has other responsibilities in addition to the responsibilities of a regular front-line inspector. Several levels of inspector and senior inspector exist just as there are several levels within a rank in other Russian military institutions (Customs officials wear military uniforms and have military ranks). Senior inspectors receive further training through a professional development program. The course that pertains to nuclear smuggling is a three-week class that focuses on nuclear detection. It is taught at the St. Petersburg and Vladivostok Customs Training Academies.

### **Technical Specialist**

This person either obtained a technical college degree prior to being hired by Russian Customs or received a technical-training degree from one of the Customs four academies' college-equivalent programs. The training may bestow a degree similar to a US masters degree. This person works in a specialty field such as nuclear materials or export control. Russian Customs is in the process of developing a 24-day course for these nuclear materials specialists at one of the two academies that conduct nuclear training (St. Petersburg and Vladivostok). The syllabus has already been completed. The technical part of the course concentrates on spectroscopy. The nuclear specialists are part of the Regional and Technical Department (RITTY) of Russian Customs whereas the export control specialists come under the jurisdiction of the Non-tariff Department of RC. Nuclear specialists are also assigned to one of the 18 radioactive isotope customs houses. Others are detailed to regional and local headquarters offices. Export control specialists are probably also assigned to various levels of headquarters offices, as well as to the numerous city customs houses where export control licenses are checked.



**Figure 1: Training Personnel**

### **Assessing Training Fundamentals**

In the initial stages of developing a plan for training assistance, two steps were taken. One was to gain familiarity with US Customs Service (USCS) training to provide examples of what might be done for the RFSCC. The USCS uses a variety of locations, media and types of training, including formal classes, videotaped demonstrations, local classes, problem-solving workshops, and on-the-job training. Furthermore, Russian syllabi were obtained and compared with USCS and WCO syllabi, and Russian classes on nuclear training were observed. A hands-on training program for foreign customs employees, held at the HAMMER facility in Washington State, was also observed for comparative purposes.

The second step involved investigating what modern US training practices might be useful to introduce into Russian customs. Process analysis is a frequently used approach that determines the procedures customs trainees should follow as they train to curtail nuclear smuggling. Stopping smuggling is a complex task limited only by the ingenuity of smugglers and their customs opponents. A structured approach is therefore needed to assess the various ways to halt smuggling so that a comprehensive list of training options could be developed and to compare their relative contributions to the prevention of nuclear smuggling. To further familiarize ourselves with process analysis as applied to Customs activities, we chose the test case of smuggling in a seaborne container and broke down the daily activity undertaken by the different customs employees that might be involved in this task. Visits to US Customs facilities provided us with vital information to

analyze this test case. This exercise provided vital information regarding what should be taught in the classroom.

After formulating our ideas on what should be taught, the question naturally arises as to where such training might fit into the Russian training program. This led to the following questions:

- What information will the training teach?
- Who is trained?
- Who conducts the training?
- Where does the training take place?
- What kinds of materials and media are used in the training?

Understanding the various types of employees and their roles and activities goes a long way toward answering the content of the training question. In determining how best to assist RFSCC, two scenarios regarding the level of RFSCC training development became evident and SLD's contribution would depend on which situation pertained:

- 1) Standardized procedures already exist within the RFSCC to conduct effective nuclear smuggling detection and export control (NS/EC) searches and the SLD program needs to provide assistance to ensure that training reaches all personnel and that the procedures are taught using modern teaching techniques. Procedures appear to exist for curtailing nuclear smuggling task but are rather limited in the area of controlling illicit exports.
- 2) Adequate procedures have not been developed within the RFSCC to carry out a set of activities and both the procedures have to be developed and then training for them has to be developed. This is more likely to be the situation for export control issues. There must be a database of dual-use commodity items with which the inspector can familiarize himself and utilize. Prior to development of the database, training can only be conducted in a vacuum. Developing the database is therefore an essential piece of the training assistance work even though the database is not only useful for training, but for the actual work once trained inspectors return to their place of work.

Thus, training assistance may involve aiding the RFSCC in developing or improving procedures that their employees will use in their effort to prevent nuclear smuggling and illegal exports.

Once a framework of options for cooperation on training programs was developed, it became possible to examine just what contributions the US could provide to the RFSCC to assist in training to counter nuclear smuggling and export control violations. An assessment of what training material should go into curricula development is only one portion of the overall training architecture. Others include media uses for training, means of delivering training to inspectors in the field, and communications-based training.

The curricula project is the cornerstone of the assistance provided to the RF SCC on training. This project is supported by both an equipment project as well as a multimedia technology project. A final component that focuses on information support will also be discussed.

## **Curricula**

The purpose of this component is to add to or improve upon existing curricula used in training. Curricula play a role in both the academy training and the on-site training. RFSCC curricula involve a large amount of academic training in nuclear physics, theory of equipment operation, and legal guidelines. While important, the existing curricula do not contain material that is standard in USCS and WCO courses. In Russia, training about procedures essentially concentrates on training the student to perform effectively one aspect of his normal set of tasks. For example, one procedure might be interrogation of a vehicle driver who is passing through a customs checkpoint portal detection system. In USCS training, students practice this in role-playing exercises under different circumstances, with different actors playing the interogatee, and with different cargo, as part of procedure training. Russian training may informally include this type of role-playing exercise at the job site, but the curricula component serves to improve these practices by moving this type of training to a classroom.

Teaching modules can be created for use at the training academies that cover training on how to use the equipment. These modules teach how to use the equipment in normal conditions, when they might operate incorrectly, how to interpret readings and alarms, how to react to them, what auxiliary data to use in interpreting readings, causes of false alarms and how to establish them, and various other activities that take place around the nuclear apparatus. Both academic and practical modules might be videotaped to provide a means of disseminating the fundamentals of the defenses against nuclear smuggling and export control to agents before they have a chance to cycle through the full training program. After this, video can be used for updates and refresher courses. Reference manuals will be written to allow students to maintain refresher materials with them at their worksites.

Another set of modules to be developed for academy use is often referred to as “train the trainers” training. Many senior personnel, while technically competent, do not have the skills to be good teachers. Yet senior inspectors will be learning NS/EC material at the academy and will be expected to take home this knowledge to teach portions of the course to inspectors in their regions. These modules will train the senior inspectors on how to effectively communicate their knowledge, how to plan and give examinations, how to conduct classes, and how to interpret and respond to student questions.

## **Equipment**

The equipment portion of the training plan focuses on providing the training academies with enough technical equipment to allow them to teach the various types of students attending the academy—this includes those engaged in professional development at the inspector, senior inspector, and technical specialist level, as well as the career officer training as part of the five-year course. The equipment includes detection equipment that inspectors use, such as hand-held dosimeters and portal monitors, spectroscopic equipment that technical specialists use, and computers for the academies that will allow students to engage in computer-based training programs. The academies do not have computers that can be dedicated to NS/EC smuggling. The

vision for the use of the computers is to have a computer intranet inside the classroom, controlled by a computer at the instructor's desk, that will allow him to pose problems to the students, show viewgraphs, manifest forms, shipper export declarations in both legitimate and forged varieties, and provide individual tests on a more regular basis than the scheduled exams.

### **Multimedia**

Training effectiveness is enhanced by the use of multimedia and information technology. One possibility for Russian use of information technology involves databases, accessible locally via computer connections. Another is a video link between customs posts and the expert centers.

Databases and the ability to access them correctly and effectively is a crucial requirement for a task as complex as detecting and interdicting nuclear smuggling and export control violations. Means need to be created for the building and enlargement of the databases. Adding graphics to a database improves the ability of the user to obtain information quickly. There are several potential databases, such as a radioactive isotope list, that relate to NS/EC problems, and each of them can be investigated for efficiency improvements available through different types of multimedia.

It is also necessary to train users on their access to these databases. This can be accomplished through self-teaching, with a form of computer-aided instruction, or as part of the other training curricula. Each database will require its own instructional information, covering the purposes of the database, its structure, and access methods. The databases may be centralized for ease in preparation and updating, provided that the communication links between customs posts and the central sites are adequate.

Upgrading the connection between posts and the expert center network to a video system may both improve response time and accuracy of the responses. The task of the expert system is to provide answers to the questions raised by suspicious inspectors confronted with unknown articles. There are time limits imposed by Russian law on the delays that can be allowed in this review, and having the ability to rapidly use the expert center hookups will help reduce the concerns that Russian Customs may have about enforcement of export control laws.

### **Information Support Centers**

An information support center is a broad term that means many things to many people. The essence is that field personnel have a communications tie to a group of experts that can answer questions too difficult for the field personnel. The clearest need for such a center is for dual-use commodities. If a field inspector can be trained to be suspicious of the right cargo, he can call upon an expert center to validate his suspicions. Other uses for experts are to provide information on what to do in case of a radiation hazard emergency, on forensics, and on nuclear material identification. A phone line and fax are needed so that documents or the object (or parts of it) can be visually transmitted to a place where experts work.

The networking of an expert center depends on how it will be used. If the experts are co-located, the expert center can itself serve as a node, and each border post can directly connect to it. If there

are a number of experts located around Russia, each with their own expertise and schedule, a coordinating node may be necessary. One network design has the local ports connected to the local and then the regional headquarters office, and from them to the customs headquarters in Moscow. The Moscow node will link to MinAtom, which will link to the various institutes and laboratories where the experts reside. Other sources of expertise might be tapped from the Moscow node, such as the Center for Export Control, consultants, defense experts, or other agencies involved with export control.

Establishment of the information support center is a long term goal of the SLD program. For now, this project is focussing on the development of databases that will provide inspectors in training classes and in the field information about radioisotopes being shipped out of Russia as well as information about the type of container in which the isotopes are shipped.

### **Conclusion**

The effective use of NN-43 training assistance funding involves determining what gaps exist in Russian training and how best to fulfill them. It is necessary to define the tasks that inspectors involved in nuclear smuggling and export control will do, and then to determine what training they need. Training assistance currently focuses on enhancing Russian curricula so that the inspector in the field can better learn how to perform his job.

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