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THE ROLE OF THE GEORGE KUZMYCZ TRAINING CENTER IN IMPROVING THE NUCLEAR MATERIAL MANAGEMENT CULTURE IN UKRAINE

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ABSTRACT

The George Kuzmycz Training Center for Physical Protection, Control and Accounting (GKTC) was established in 1998 in a collaborative endeavor of the State Nuclear Regulatory Administration of Ukraine, the Ukrainian Academy of Sciences, and the U.S. Department of Energy. Located at the Institute for Nuclear Research in Kyiv, the GKTC provides theoretical and practical training in physical protection, control, and accounting techniques and systems that are employed to reduce the risk of unauthorized use, theft, or diversion of weapons-usable nuclear material. Participants in GKTC workshops and courses include nuclear facility specialists as well as officials of the State's regulatory authorities. Recently, the training scope has been broadened to include students from other nations in the region.

BACKGROUND

When the collapse of the Soviet Union left weakened governmental controls over nuclear materials within its successor states, concerns arose that their weapons-usable fissile materials (plutonium and highly enriched uranium) might be vulnerable to theft or diversion. These materials are potential targets for countries that wish to develop nuclear weapons capability or terrorist groups who seek to possess an improvised nuclear device. In response, the U.S. Government sponsored efforts to make rapid improvements in the security and accountability of all weapons-usable nuclear materials in the Soviet successor states. In collaboration with our host counterparts, U.S. experts upgraded site physical protection systems, material control and accounting systems, and measurement capabilities at numerous sites in the Russian Federation and at 13 sites in Ukraine, Kazakhstan, Belarus, Uzbekistan, Latvia, Lithuania, and Georgia.* [1] With the upgrades completed, our focus turns to ensuring that the operation of these material protection, control, and accounting (MPC&A) systems is sustained.

An important component of a program to sustain MPC&A upgrades is to enhance the safeguards culture of the recipients. This was accomplished in part by providing on-site training to personnel charged with operating and maintaining MPC&A equipment and with developing related procedures. This alone, however, does not provide assurance that the work of protecting nuclear materials will continue in the wake of personnel turnover and when U.S. assistance ends. Therefore,

* Because the nuclear material at the Center of Applied Research in Tbilisi, Georgia, have been removed from the site, no further U.S. assistance is provided.

to ensure currency and continuity of operations and maintenance knowledge, it has been expedient to establish ongoing, centralized programs of MPC&A training and education. In the Russian Federation, such programs now exist at the Russian Methodological and Training Center, the Interdepartmental Special Training Center, the Moscow Engineering Physics Institute, and the Tomsk Polytechnic University.[2]

Outside the Russian Federation, an MPC&A training center was established at the Kyiv Institute for Nuclear Research (KINR) in a collaboration of the State Nuclear Regulatory Administration of Ukraine, the Ukrainian National Academy of Sciences, and the U.S. Department of Energy. Beginning in October 1997, over 4300 square feet of one floor of the KINR administration building was extensively remodeled to house two large, partitioned lecture rooms, a computer instructional laboratory, and several multipurpose rooms for instruction, curriculum development, and administration. A grand-opening ceremony for this facility, named for the late George Kuzmycz, was held on October 8, 1998. In October 1998, the training center staff participated in an instructor development course prepared by Sandia National Laboratories. The first training course commenced at the GKTC on December 14, 1998.

The George Kuzmycz MPC&A Training Center (GKTC) [3] was established initially to provide comprehensive MPC&A training to Ukrainian nuclear specialists. In 2000, its mission was expanded to include regional NIS MPC&A training. Components of the existing curriculum have been modified and expanded to accommodate the needs of other Soviet successor states with non-nuclear-weapons status.

GKTC CAPABILITIES

The climate-controlled facilities at the GKTC include:

- Two spacious lecture rooms, accommodating 50 participants each (movable partitions allow the two lecture rooms to be divided into four separate classroom areas);
- A conference room with round-table seating for 15 participants;
- A well outfitted business center with facsimile machines, copiers, a color laser printer, and internet and electronic mail access;
- State-of-the-art training equipment, including computer projectors, video cassette recorders, and overhead projectors;
- A computer training laboratory equipped with 10 networked personal computers and seating for up to 20 students;
- A well equipped kitchen in which snacks and refreshments can be prepared for training breaks;
- A library; and
- Staff offices.

In addition, the close proximity of the GKTC to KINR's research reactor affords excellent opportunities to use its upgraded MPC&A systems for teaching demonstrations and practical exercises.

Members of the GKTC staff, which includes dedicated as well as adjunct faculty, regularly consult with Ukrainian organizations and regulatory bodies that protect, use, regulate, or license nuclear materials and facilities. As the hosts of the Ukrainian Chapter of the Institute for Nuclear Materials Management, the GKTC staff plays an important role in sustaining and improving the nuclear material management culture in Ukraine. This facilitates their acquisition and distribution of the latest information in the field to Ukrainian specialists.

TRAINING HIGHLIGHTS

Ukrainian participants in the courses and workshops offered at the GKTC have included specialists from the four facilities at which the U.S. sponsored MPC&A upgrades (KINR, the Kharkov Institute of Physics and Technology, the South Ukraine Nuclear Power Plant, and the Sevastopol Institute of Nuclear Energy and Industry[4]), the Ukrainian governing authorities on matters relating to nuclear facilities and materials (Ministry of Energy, State Committee on Nuclear Power Utilization, State Nuclear Regulatory Committee, Ministry of Internal Affairs, Security Service, and some departments of the Cabinet of Ministry), and the other nuclear power plants. Annually, the GKTC hosts about twenty significant seminars, workshops, or courses on the management of nuclear facilities and materials. Over two hundred specialists from Ukrainian nuclear facilities and scores of international participants receive MPC&A training at the GKTC each year.

Ukrainian and American experts jointly developed most of the training courses and workshops presented at the GKTC. Many were based on corresponding training that was previously offered by the U.S. National Laboratories and the Nonproliferation and National Security Institute under Department of Energy sponsorship. All GKTC offerings have been revised to correspond with Ukrainian regulations, requirements, and conditions.

Recent presentations at the GKTC have included a pair of workshops in which Design Basis Threat (DBT) development methodology for Ukraine and Ukrainian facilities was developed; an international workshop on MPC&A procedures development; an IAEA-sponsored international workshop on nuclear material accounting and reporting; a series of short courses on computerized nuclear material accounting; a nuclear facilities security course designed for protective forces; and a workshop on maintaining electronic security systems.

Perhaps the most highly successful GKTC offering to date was the two-part workshop on DBT development methodology held in July and November 2000. Developed and led by experts from Sandia National Laboratories, these workshops assisted the participants in (1) developing a Ukraine-specific statement on the attributes and characteristics of potential insider and/or external adversaries who might attempt unauthorized removal of nuclear materials or sabotage against nuclear facilities, and (2) evaluating nuclear facility physical protection system designs against that statement. As a direct result of these workshops, Ukraine's DBT statement was drafted. It is now being formalized, and Ukrainian nuclear facilities are already being evaluated against it.

The GKTC's first international training event was held on June 19-23, 2000. In it, experts from Sandia National Laboratories led representatives of Kazakhstan, Ukraine, and Uzbekistan in practical instruction in the development of MPC&A procedures. The workshop emphasized the

importance of formalizing procedures that cover such areas as nuclear material accountancy, security system operations and maintenance, emergency response, performance testing, and other topics important in the daily operation of nuclear facilities.

In July 2000, the GKTC hosted an IAEA-sponsored international workshop on nuclear material accounting and reporting. In addition to the IAEA staff members that led this workshop, the participants included representatives of Armenia, Belarus, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Kazakhstan, Romania, Uzbekistan, and Ukraine. In a second offering of this workshop in March 2001, attendees came from nine of the eleven nations represented at the earlier session.

At all four of the Ukrainian nuclear facilities at which the U.S. sponsored MPC&A upgrades, as well as at the State Nuclear Regulatory Committee of Ukraine, computerized nuclear material accounting is performed using the Automated Inventory/Material Accounting System (AIMAS), which was jointly developed by U.S. and Ukrainian experts.[5] The successful implementation of AIMAS at these sites is attributable to a very effective series of both introductory and advanced training sessions for AIMAS users in the GKTC computer instructional laboratory. A product of the collaboration of the AIMAS developers and the GKTC staff, the AIMAS training series has been presented exclusively by our Ukrainian partners for over a year. Convening the same core group of professionals in regular AIMAS training sessions has produced the added benefit of forming an ad hoc users group. The AIMAS users group has made significant contributions to debugging and to improving AIMAS. In addition, they have established a camaraderie that fosters the collaborative approach to applying AIMAS to solve day-to-day problems of nuclear material accounting. Recently, AIMAS training sessions have been added for users and potential users from Kazakhstan and the Ukrainian nuclear power plants.

In Ukraine, armed protection forces from the Ministry of Interior (MVD) are assigned to guard most nuclear facilities. Since 1997, the MVD has expressed great interest in receiving from the U.S. specialized instruction similar to the training given to protective forces that provide security at U.S. nuclear facilities. In June 2001, the GKTC and experts from Sandia National Laboratories and the MVD collaborated to present such a workshop to MVD training officers and first-line supervisors. This workshop included training in information security, personnel security, physical security, communications, material control and accountancy, and post operations. It also included protective-force-specific modules such as levels of force, authority and responsibility, and enforcement of access control. Instruction in intermediate response force operations (observation techniques, tactical movement, bomb threat recognition and searches, and crime scene preservation) was included in the second week. A third week of instruction is planned for August 13-17, 2001. Focused on unusual occurrence and emergency management, this workshop will cover crisis resolution, containment operations, use of force, arrest techniques, and operations orders and tactical plans.

A single manufacturer, the Advantor Corporation, produced the electronic security systems installed at all four Ukrainian nuclear facilities and at two of the Kazakhstani sites at which the U.S. sponsored MPC&A upgrades. To reduce facility dependence on the manufacturer for maintenance and service, we sponsored at the GKTC a two-week training workshop on Advantor security systems. Geared for both users and system managers, the workshop provided hands-on training in system options programming, alarm panel graphics setup, testing and maintenance, as well as

theory of operation. Security specialists assigned to pertinent Ukrainian and Kazakhstani nuclear facilities participated with great benefit in these workshops. A sequel is tentatively planned for the fall of 2001.

The GKTC's MPC&A curriculum catalog now includes the following courses and workshops:

- Fundamentals of Material Control and Accounting (MC&A);
- Statistics, Variance Propagation, and Measurement Control;
- Structure and Management of a Safeguards Seals Program;
- Computer training (Microsoft® Windows, Office, and Access);
- Nuclear Material Physical Protection – Transportation;
- MC&A Survey Procedures;
- MC&A Inspection;
- Materials Accounting for Nuclear Safeguards;
- Basic Information Security;
- Electronic Security Systems;
- MPC&A Procedures Development.

In addition, the GKTC staff has made a Russian-language translation of a self-paced course on nuclear materials measurements (MCA-104D) developed by the U.S. DOE Nonproliferation and National Security Institute.

The following table provides a synopsis of the MPC&A training activities at the GKTC during 2000 and 2001:

DATE	DESCRIPTION	TARGET AUDIENCE
Mar 20-24, 2000	Advanced AIMAS Workshop – Data Preparation	Ukrainian user group
May 15-19, 2000	Advanced AIMAS Workshop – Reporting	Ukrainian user group
June 12-16, 2000	Introduction to AIMAS Workshop	New potential users
June 19-23, 2000	MPC&A Procedures Development Workshop	International
July 3-6, 2000	Nuclear Material Accounting and Reporting Workshop	International (IAEA-sponsored)
July 10-14, 2000	Advanced AIMAS Workshop - System Administration	Ukrainian user group
July 18-21, 2000	Design Basis Threat Workshop, Part I	Ukrainian facility experts & regulators
Sept 11-15, 2000	Introduction to AIMAS Workshop	New users from Kazakhstan
Sept 25-Oct 5, 2001	Electronic Security Systems Workshop	Ukr. & Kaz. Advantor security system users
October 2-6, 2000	Illicit Trafficking Workshop	Ukrainian officials (IAEA-sponsored)
Nov 14-16, 2000	Design Basis Threat Workshop, Part II	Ukrainian facility experts & regulators
Mar 26-30, 2001	Nuclear Material Accounting and Reporting Workshop	International (IAEA-sponsored)
May 21-25, 2001	Advanced AIMAS Workshop – Data Entry	Ukrainian user group
June 4-8, 2001	Accident Management Workshop	International (IAEA-sponsored)
June 18-29, 2001	Nuclear Facility Security Course, Part I	Ukrainian Ministry of Interior
July 2-6, 2001	AIMAS Configuration and Facility Description Workshop	Ukrainian user group
Aug 13-17, 2001	Nuclear Facility Security Course, Part II	Ukrainian Ministry of Interior
Sept 10-14, 2001	Advanced AIMAS – Custom Reporting	Ukrainian user group
Sept 24-28, 2001	Electronic Security Systems Workshop (tentative)	Users of Advantor security systems

IN MEMORIAM

On December 6, 1997, George Kuzmycz perished with three others in an automobile accident in southern Ukraine. Under Kuzmycz's leadership, the Department of Energy had cooperated with ministries and departments of the Ukrainian Government since 1994 to improve the security of weapons-usable material at several locations in Ukraine. Proud of his Ukrainian heritage, George was passionate about his program and particularly effective in managing it in Ukraine. He was known for treating everyone who crossed his path with warmth, respect, and courtesy. He was a man of honor whose memory will be cherished always by his friends and colleagues in the U.S. and in Ukraine.

ACKNOWLEDGMENT

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