

**Technical Secretariat of the Committee on Cooperation  
for the Elimination of Nuclear Weapons Reduced in Ukraine**

**Post-evaluation on the Technical Assistance Project  
for Upgrading the State System of Nuclear Accountancy and  
Control and the Physical Protection System  
Implemented in Past Years in Kazakhstan, Ukraine and Belarus  
as Part of Cooperation for the Elimination of Nuclear Weapons  
Reduced in the Former Soviet Union  
(Ukraine)**

**Evaluation and Survey Results**

**August, 2005**

**Japan Atomic Industrial Forum, Inc.  
Unico International Corporation**

## 1. Outline of the Project

- Country: Ukraine
- Name of the Project: Technical Cooperation Project for Upgrading the Nuclear Material Accountancy and Control System and Physical Protection System
- Area: Safeguards
- Form of Cooperation: Equipment Provision
- Total Cost: 530 million Japanese Yen
- Project Duration: Apr. 1995 - Apr. 2000
- Targeted Organizations/Facilities :
  - The State Nuclear Regulatory Committee of Ukraine (SNRCU)
  - The State Scientific and Technical Center on Nuclear and Radiation Safety (SSTCNRS) attached to the SNRCU
  - George Kuzmycz Training Center for Physical Protection, Control, and Accounting of Nuclear Material (GKTC) attached to the Institute for Nuclear Research (INR)
  - Kharkov Institute of Physics and Technology (KIPT)
- Other Related Assistance:
  - Provision of Medical Equipment to the Central Military Hospital attached to the Ukraine Defense Ministry

### 1-1. Background of the Cooperation

When the Soviet Union collapsed in 1991, Ukraine became an independent state which had nuclear facilities such as the INR, the KIPT, and the Sevastopol Institute of Nuclear Energy and Industry, and five operating nuclear power stations,. Ukraine acceded to the Nuclear Nonproliferation Treaty (NPT) in December 1994 and was subject to the safeguards system of the International Atomic Energy Agency (IAEA) in February 1998. For the purpose of establishing safeguards systems and improving the technical infrastructure of Ukraine, Japan provided with measurement equipment and physical protection (PP) system to the KIPT and provided with measurement equipment to the SNRCU and the INR, according to the IAEA Coordinated Technical Support Plan.

#### [Note] The IAEA Coordinated Technical Support Plan:

The support plan was drawn up by donor countries, recipient countries and the IAEA through consultation among them with the IAEA as coordinator, in order to establish the nuclear nonproliferation regimes of the Newly Independent States (NIS) as early as possible after the collapse of the Soviet Union. Specifically the objective of the plan was to assist the NIS in establishing or enhancing the nuclear material control and accounting system, the physical protection system and the export/import

control at the state and facility levels. The plan was designed so that donor countries would share the support projects and implement them effectively and efficiently. Japanese assistance project was carried out based on the IAEA coordinated plan.

## **1-2. Contents of the Cooperation**

### **(1) Objectives:**

Ukrainian acceptance and compliance of the IAEA safeguards

### **(2) Contents:**

Contribution to the establishment of the State System of Accounting for and Control of nuclear material (SSAC) and the Physical Protection (PP) system

### **(3) Results:**

Requirements under the IAEA safeguards were complied.

PP system including access control and entry/exit control was enhanced.

Proper information system, which can process the state safeguards data efficiently using Personal Computers (PCs), was introduced.

Safeguards operation capacity of the SNRCU, the State Scientific and Technical Center on Nuclear and Radiation Safety (SSTCNRS), the GKTC, and the KIPT was improved.

### **(4) Inputs**

#### **<Japanese Side>**

Provision of measurement equipment, including survey meters for radiation control, nondestructive measurement instruments, for the SNRCU

Provision of measurement equipment, including survey meters for radiation control, for the INR

Provision of measurement equipment, including survey meters for radiation control, nondestructive measurement instruments, and radiation monitoring equipment, for the KIPT

Provision of PP system, including entry/exit control system and access control system, for the KIPT

#### **<Ukrainian Side>**

Arrangement of necessary personnel and implementation of training of related staff and engineers

Provision of installation locations and storage places for the supplied equipment and systems

Cost burden for operation and maintenance of the supplied equipment and systems.

## **2. Outline of the Evaluation and Survey Team**

- Survey team: Japan Atomic Industrial Forum, Inc. and Unico International Corporation
- Survey period: Jan. 24, 2005 ~ Feb.5, 2005 (including visit to the IAEA)
- Type of survey: Post-evaluation.

## **3. Outline of the Evaluation Result**

### **3-1. Surveyed Organizations/Facilities**

- (1) The SNRCU
- (2) The SSTCNRS attached to the SNRCU
- (3) The GKTC attached to the INR
- (4) The KIPT

### **3-2. Evaluation Result**

As a result of the survey, it was confirmed that all the equipment and facilities provided through the cooperation project, i.e. monitoring equipment and entry/exit control systems necessary for the system configuration of the SSAC system and the PP system had worked smoothly and that their operation and maintenance had been carried out properly by each recipient organization. Especially the SNRCU's emphasis on the operation and maintenance of supplied equipment is indicated in its implementation of their regular monitoring. It was suggested from the KIPT that most supplied equipment which was made abroad has both merit and demerit from the viewpoint of maintenance. When interviewing the IAEA, it was confirmed that there were no problems with the results of the IAEA safeguards inspection in Ukraine and that the IAEA coordinated technical support plan finished successfully with the aid of Japan and other donor countries.

This assistance can be said to have achieved almost satisfactory results in the light of the original goal. This point was highly appreciated not only by the surveyed organizations/facilities but also by the IAEA officials.

#### **(1) Relevance**

It can be evaluated for the following reasons that this project satisfied needs of all the stakeholders (Japan, Ukraine, IAEA, and other donor countries, including the United States, Sweden, Finland and Hungary).

Equipment necessary for the IAEA safeguards has been set up at the best suitable places and used effectively for the inspection.

It was confirmed that necessary equipment was installed in appropriate places of the safeguards applied facilities and utilized effectively on their inspection. Especially in the KIPT, after the introduction of a remote monitoring system in 2002, the number of the IAEA inspection has decreased. The supplied equipment which formed a part of the remote system can be said to have played an important role in the IAEA safeguards.

This project of equipment provision was consistent with the denuclearization policy of Ukraine.

Ukraine acceded to the NPT in December 1994. The safeguards agreement (INFCIRC/550) between Ukraine and the IAEA went into force in January 1998. The removal of strategic nuclear weapons was completed in 1996. Ukraine also joined the Nuclear Suppliers Group (NSG) and the Zangger Committee. Ukraine, which used to be a manufacturing center for nuclear weapons in the Former Soviet era, now makes an appeal of her promoting peaceful use of nuclear energy to the international community. It is recognized that the project was consistent with the policy and efforts of Ukraine.

This project brought about a synergistic effect with cooperation of other donor countries.

After the database of nuclear material accountancy and control was completed by the support of the United States, personnel training courses were implemented as Japanese assistance project. Both the US and Japanese supports could produce efficient and synergistic results.

## **(2) Effectiveness**

Regarding effectiveness, the objectives envisioned in the planning stage were almost attained for the following reasons.

Nuclear material accountancy and control has been carried out at the level of IAEA requirements, using the provided equipment.

Beside the IAEA inspections, the SNRCU itself makes an independent inspection by using effectively the supplied equipment.

The provided PP system has worked normally and contributed to discovery of unidentified objects and suspicious individuals.

There used to be the PP system dependent on the armed guards in Ukraine in past days, but the level of the PP system of each organization and facility has been improved significantly through cooperation of Japan and other donor countries.

Operation and maintenance of the provided equipment is implemented properly to respond to the current task.

All the major equipment provided is used for the purpose intended and is kept in good condition.

The project has contributed to nuclear nonproliferation.

Measurement equipment, including nondestructive measurement equipment, which was provided to the SNRCU and the KIPT, forms part of the state accountancy and control system of Ukraine and fulfils its role. The physical protection system, including entry/exit control system and access control system, supplied to the KIPT, achieves its objective fully. These equipment and system contributed to establishment and improvement of nuclear nonproliferation regime of Ukraine.

Smooth communication among organizations and facilities has been produced.

In the assistance project, many PCs were supplied to the targeted organizations and facilities as part of accountancy and control system. As a result, communication between the SNRCU and each nuclear facility is now almost conducted with the use of PCs and exchange of data is principally implemented through electronic medium.

### **(3) Efficiency**

Efficiency has increased for the following reasons.

The project was completed almost in accordance with the denuclearization schedule of Ukraine.

Design, installation and construction were compliant with the global standards and were completed as planned, without lagging behind schedule. However, it took more than one year for some equipment to be stored at the customers office due to the tax exemption procedures.

IAEA coordinated technical support plan was carried out by advanced nations including Japan.

IAEA coordinated technical support plan for Ukraine was completed as planned through assistance of Japan, the United States, Sweden, Finland and Hungary.

The provided equipment was suitable for the actual use.

Equipment was delivered at appropriate prices. Equipment was selected in line with Ukrainian request and actual use. Most equipment works now without failure. On-site engineers and staff appreciated high quality of Japanese made and the US made equipment, and expressed a comment that Japanese equipment is unbreakable. But, it was indicated that because of foreign made goods, difficulties occurred in terms of maintenance and the design certification system of Ukraine.

#### **(4) Impact**

The following positive impact was acknowledged.

##### Overall improvement of the level of the staff and engineers

In the training courses held by the GKTC, the supplied PCs and measurement equipment have been made the most use of and contributed to acquisition of knowledge and skills by trainees, leading to improvement of skill level of the whole nuclear related personnel in Ukraine.

##### Contribution to the local residents

Though it was not an expected impact, the lighting equipment forming the monitoring system set up along the outer fence of the KIPT resulted in shining the public sidewalk partially adjacent to the KIPT. The local residents expressed their thanks that security of the public sidewalk at night was assured, which led to a part of public relations activities for the Japanese assistance project.

#### **(5) Sustainability**

It is difficult to evaluate the sustainability exactly because organizational information of the targeted organization/facilities is confidential matters, but the followings were acknowledged as long as the survey team interviewed on the sites.

##### Budgetary steps for operation and maintenance of the equipment have been taken.

Regarding operation and maintenance of the provided equipment, no problems were acknowledged in particular.

##### Human resources development system has been established and trained staff and engineers have not quit their job.

Each organization and facility has made active efforts holding periodically education, training and workshop, and dispatching personnel to the seminar held abroad. It is said that the separation rate of trained engineers and staff is very low.

##### Operation and maintenance of the facilities and equipment has been kept with self-help efforts after completion of the cooperation project.

Supplied equipment has been operated and maintained appropriately by each organization and facility with self-help efforts. KIPT prepared its own maintenance and inspection manual with the advice of manufacturers of the supplied equipment and put into practice.

##### Acceptance of the IAEA safeguards has been continued without problem.

Ukrainian acceptance of the IAEA safeguards inspection has been continued up to the present without problem. The number of the IAEA inspections in KIPT has

decreased owing to introduction of a remote monitoring system.

Laws and systems related with nuclear energy have been established.

Laws and systems related with nuclear energy of Ukraine have been developed fairly from quite a clean slate to the international standard level by the earnest efforts of the nuclear related ministries and agencies. For example, there are “The Law on the Use of Nuclear Energy and Radiation Safety (1995),” “The Decree of the Cabinet of Ministers on the State System for Accounting and Control of Nuclear Material (1996)” and “The Law on the Licensing of Activities in the Field of Nuclear Energy (2000).” According to the SNRCU, however, certain law and regulations were inherited from the former USSR and are in some cases inconsistent with the present situation.

### **3-3. Lessons and Recommendations**

#### **(1) Considerations on the occasion of equipment provision**

It is necessary to consider the possibility of arrangement to replacing goods and parts in preparation for their failure and aging, as well as the software language and technical upgrading of IT devices including PCs. In Ukraine, the supplied equipment, which was Japanese-made or the US made, was appreciated highly of its good quality, but caused difficulties in terms of maintenance and repair, which constitute shortcomings. Because of the design certification system of Ukraine, all foreign made equipment is subject to the system and must share the necessary cost. Therefore, it is necessary to discuss sufficiently with the other party in selecting the provided equipment. It is also necessary to advance the consideration for rapid implementation of further sophistication of the PP system against terrorists to meet international demand.

#### **(2) Consultation with the IAEA**

The IAEA is familiar to the circumstances of Ukrainian nuclear facilities through its safeguards inspections and the International Physical Protection Advisory Service (IPPAS) missions. It is necessary not only to consult with Ukraine but also to exchange information substantially and to consult with the IAEA on future assistance. Regarding introduction of additional protocol in Ukraine (signed in 2000, not yet ratified), the IAEA and Ukraine wish Japanese assistance to Ukraine, such as human resources development, and provision of related equipment.

#### **(3) Cooperation and assistance with a Japanese flag**

Japanese cooperation was conducted in a visible manner as the provided equipment was affixed with labels of a Japanese logo (to be precise, a logo of the Japan-Ukraine Committee on Cooperation for the Elimination of Nuclear Weapons). When the cooperation project was completed, a memorial ceremony was held and

received press and TV coverage. Incidentally, the Kuzmycz Training Center (GKTC) was named after the US Department of Energy Officer, Mr. George Kuzmycz who played a leading role in assisting nuclear nonproliferation in Ukraine. In the future, it is necessary to continue to make efforts and devise good ways so that Japanese cooperation could be effectively known by many people in Ukraine.

**(4) Importance of Japanese international contribution to nuclear nonproliferation**

Ukraine, which attained independence on the collapse of the Soviet Union, had nuclear weapons in its territory, but went the way for denuclearization. Ukraine acceded to the NPT in December 1994 as non-nuclear weapon state. Fifteen nuclear power plants with a total generating capacity of 13,800 MWe are now in operation, and fulfill an important role as essential power source like Japan. As Japan played a core role in establishment of physical protection and safeguards in Ukraine, it is very important for Japan to continue to contribute to their improvement and enhancement in Ukraine.