

**Technical Secretariat of the Committee on Cooperation
for the Destruction of Nuclear Weapons Reduced
in the Republic of Kazakhstan**

**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
(Republic of Kazakhstan)**

Evaluation and Survey Results

August, 2005

Japan Atomic Industrial Forum, Inc.

Unico International Corporation

1. Outline of the Project

- Country: Republic of Kazakhstan
- 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: 540 million Japanese Yen
- Project Duration: Sep. 1994 - Oct. 1998
- Targeted Organizations/Facilities :
 - Kazakhstan Atomic Energy Committee (KAEC)
 - Institute of Nuclear Physics (INP)
 - Fast Breeder Reactor BN-350
- Other Related Assistance:
 - Provision of ESR(electric spin resonance)Instrument to the National Nuclear Center
 - Provision of Medical Equipment to the Republican Clinical Hospital for War-Invalids
 - Provision of Tele-Medical Diagnosis System

1-1. Background of the Cooperation

When the Soviet Union collapsed in 1991, Republic of Kazakhstan (hereinafter referred to as Kazakhstan) became an independent state which had many nuclear facilities, such as the Institute of Atomic Energy, Semipalatinsk (3 research reactors), the Institute of Nuclear Physics (INP), Almaty (one research reactor), Ulba Metallurgical Plant (uranium conversion facility and nuclear fuel pellet production facility), and the Fast Breeder Reactor BN-350. Kazakhstan acceded to the Nuclear Nonproliferation Treaty (NPT) in February 1994 and was subject to the safeguards system of the International Atomic Energy Agency (IAEA) in August 1995. From the viewpoint of promoting nonproliferation, it was necessary to assist Kazakhstan in establishing safeguards systems and improving the technical infrastructure. According to the IAEA Coordinated Technical Support Plan, Japan provided with equipment and facilities necessary for the nuclear material accountancy and control system and the physical production system to the Fast Breeder Reactor BN-350, the Kazakhstan Atomic Energy Committee (KAEC) and the INP.

[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:

Kazakhstan's 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 KAEC, the INP and the BN-350 was improved.

(4) Inputs:

<Japanese Side>

Provision of equipment for the accounting and control system, including a flow monitor, for the BN-350

Provision of PP system, including entry/exit control system and access control system, for the BN-350

Provision of PP system, including entry/exit control system and access control system, for the Atomic Energy Agency (now KAEC)

Provision of PP system, including entry/exit control system and access control system, for the Atomic Energy Research Institute (now INP)

Provision of measurement system for the Atomic Energy Agency (now KAEC)

<Kazakhstan 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: Nov. 27, 2004 ~ Dec.12, 2004 (Primary survey)
Jan. 24, 2005 ~ Jan.25, 2005 (Secondary survey: IAEA)
- Type of survey: Post-evaluation

3. Outline of the Evaluation Result

3-1. Surveyed Organizations/Facilities

- (1) KAEC
- (2) INP
- (3) BN-350

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. In order to cope with the rapidly evolving Information Technology (IT) system, the replenishment of expendables, the memory enhancement and the software upgrading of electronics devices and PCs have been carried out appropriately.

When interviewing the IAEA, it was confirmed that there were no problems with the result of the IAEA safeguards inspection in Kazakhstan and that the IAEA coordinated technical support plan had 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, Kazakhstan, the IAEA, and other donor countries, i.e. the

United States, Sweden and the United Kingdom)

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 BN-350, the supplied equipment contributed greatly to the IAEA inspection, by being used in discharging spent fuels out of the reactor.

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

Kazakhstan acceded to the NPT in February 1994. The safeguards agreement (INFCIRC/504) between Kazakhstan and the IAEA went into force in August 1995. In February 2004, Kazakhstan signed the additional protocol to the agreement, which is scheduled to be ratified in 2005. The project was conducted through providing necessary equipment to Kazakhstan, in response to entry of the NPT and acceptance of the safeguards. It is recognized that the project was consistent with the denuclearization policy of Kazakhstan.

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

Equipment of the system provided by Japan was compatible with those provided by the US in many cases, and it produced synergistic effect when the need to integrate both systems arised.

(2) Effectiveness

Regarding effectiveness, the objective envisioned in the planning stage was almost attained for the following reasons.

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

In the BN-350 reactor, three phases of accountancy and control by the organizations of the BN-350, the KAEC and the IAEA, have been carried out thoroughly. The provided equipment is used effectively at each phase.

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

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

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

All the major equipment provided is used for the purpose intended and is kept in good condition. The memory of the PCs that were provided to the KAEC was boosted in accordance with the upgrading of software. In the INP and the BN-350 reactor, expendables are bought and renewed by their own fund.

The project has contributed to nuclear nonproliferation.

Flow-monitor system and accountancy and control system that were supplied to the BN-350 reactor play an important part of the SSAC in Kazakhstan. The PP system including access control system, such as TV monitor, accomplishes its purpose fully and contributes to improvement of the level of nuclear material control in Kazakhstan.

Smooth communication within the facility has been produced.

The local area network (LAN) system that was provided to the BN-350 reactor as part of accountancy and control system has contributed to improvement of communication within the facility.

(3) Efficiency

Efficiency has increased for the following reasons.

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

Design, installation and engineering work were compliant with the global standards and were completed as planned, without lagging behind schedule. Kazakhstan recognizes that she could experience the way of promoting the global project and that the project was a landmark for Kazakhstan to take a step in the international community.

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

The IAEA coordinated technical support plan for Kazakhstan was completed as planned through assistance of Japan, the United States, Sweden and the United Kingdom.

The provided equipment was suitable for the actual use.

Equipment was delivered at appropriate prices. Equipment was selected in line with Kazakhstan's request and actual use. Most equipment works now without failure.

(4) Impact

The following positive impact was acknowledged.

Overall improvement of the level of the staff and engineers.

KAEC has actively introduced the provided equipment to the concerned personnel of the other nuclear related facilities, and other facilities have worked positively for establishment of the PP system and its upgrading. Awareness about physical protection of staff and engineers has also increased on the whole.

(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 each organization and facility has never fallen into shortfall of human resources, because it adopts employment plan with enough leeway and its turnover ratio is generally low.

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

The memory of most PCs was boosted in order to respond to the upgrading of software and the increase of workload. Regarding access control system, a new CRT was introduced because of failure of monitor equipment.

Acceptance of the IAEA safeguards has been continued without problem.

Kazakhstan's acceptance of the IAEA safeguards inspection has been continued up to the present time without problem.

Laws and institutions related with nuclear energy have been established.

According to the KAEC, the present laws and institutions related with nuclear energy have been established because they have not posed problems on promotion of the safe use of nuclear energy. For example, "The Regulation on Physical Protection of Nuclear Materials and Nuclear Installations" was adopted in March 1994 and "The

Law on the Peaceful Use of Atomic Energy” was adopted in April 1997.

3-3. Lessons and Recommendations

(1) Considerations on the occasion of equipment provision

It is necessary to consider the possibility of arrangement of replacement goods and parts in preparation for their failure and aging, and the software language and technical upgrading of IT devices including PCs. Furthermore there is a problem of the design certification of equipment, so it is necessary to discuss sufficiently with the other party in selecting the provided equipment.

Regarding physical protection against terrorist as international demand, it is necessary to advance the consideration for rapid implementation of further sophistication of the PP system.

(2) Consultation with IAEA

Regarding introduction of the additional protocol (signed in February 2004 and expected to be ratified in 2005) in Kazakhstan, the IAEA officials wish Japanese assistance to Kazakhstan, such as transfer of Japanese experiences, human resources development, and provision of related equipment. In Kazakhstan there are many uranium mining and milling facilities which need personnel training related with the additional protocol. It is necessary to exchange information substantially and to consult with the IAEA on future assistance.

(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-Kazakhstan 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. 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 Kazakhstan.

(4) Proper attention to other nuclear related activities between Kazakhstan and Japan

Kazakhstan and Japan have gained various experiences of cooperation relationship in the field of nuclear energy. In considering future cooperation, careful attention should be paid to such bilateral relations.