

# Swedish Support Programme on Nuclear Non-Proliferation in Central and Eastern Europe and Central Asia



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**SKI**

# **Swedish Support Programme on Nuclear Non-Proliferation in Central and Eastern Europe and Central Asia**

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## SUMMARY

At the request of the Swedish Government, the Swedish Nuclear Power Inspectorate (SKI) has established a support and co-operation programme in the area of nuclear non-proliferation with Russia and several of the republics of the former Soviet Union. The Programme was initiated in 1991 and an overall goal is to accomplish national means and measures for control and protection of nuclear material and facilities, in order to minimise the risk of proliferation of nuclear weapons and illicit trafficking of nuclear material and equipment.

The objective of the Swedish Support Programme is to help each, so called, recipient State to be able to, independently and without help from outside, take the full responsibility for operating a national non-proliferation system and thereby fulfil the requirements imposed through the international legal instruments. This would include both the development and implementation of a modern nuclear legislation system, and the establishment of the components making up a national system for combating illicit trafficking. The support and co-operation projects are organised in five Project Groups (i.e. nuclear legislation, nuclear material control, physical protection, export/import control, and combating of illicit trafficking), which together cover the entire non-proliferation area.

Up till June 2000, support and co-operation projects, completed and on-going, have been carried out in ten States, namely Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Russia and Ukraine. Furthermore, programmes have been initiated during the first part of 2000 with Estonia, Uzbekistan, Kyrgyzstan and Tajikistan. In addition, assistance has been given to Poland on a specific nuclear material accountancy topic. All projects are done on request by and in co-operation with these States. The total number of projects initiated during the period 1991 to June 2000 is 109, thereof 77 have been completed and 32 are currently on-going.

It is the convinced understanding and opinion of the Swedish Support Programme Management that the States in question are seriously motivated and are carrying out an ambitious work to develop and improve their national non-proliferation regimes, in spite of their shortcomings concerning financial and human resources. For those States, with which Sweden has established support and co-operation programmes with "full-scope" non-proliferation objectives, it is judged that the goals reached, up till now, are very satisfactory, and that the States in question have come a long way towards the fulfilment of international requirements.

The Programme is now entering a third phase and the future Programme plans are currently under consideration. A broad outlook of the future activities is made in chapter D of this report.



## A. INTRODUCTION

### GENERAL

The foundation of the Swedish Support Programme on Nuclear Non-Proliferation is **co-operation** between Swedish and State counterparts. A driving mechanism is the continuous exchange of information, experience and opinions, and the results obtained should be considered as the outcome of joint ventures. Thus, the States are often more co-operation partners than recipient parties. This notwithstanding and for the sake of a simplified, internationally applied terminology, the States are here referred to as Recipient States.

### BACKGROUND

Sweden's overall support and co-operation programme was established short after the disintegration of the former Soviet Union, and has the objectives to promote a safe and secure environment, to strengthen the democratic culture, and to support a socially and environmentally solid economic transition.

Part of that programme concerns nuclear safety and nuclear non-proliferation, for which the Swedish Nuclear Power Inspectorate (SKI) is the responsible government agency in charge of funds and implementation of support activities. The SKI has received governmental financing for co-operation with and support to the, so-called, Newly Independent States (NIS)<sup>1</sup>, the Baltic States<sup>2</sup> and the Russian Federation (Russia), on an annual basis, since late 1991.

The non-proliferation part of the programme comprises activities that are aimed at the prevention or deterrence of the proliferation of nuclear weapons or nuclear material and equipment that could be used for weapon purposes. The programme has been given the title:

“Swedish Support Programme on Nuclear Non-Proliferation  
in Central and Eastern Europe and Central Asia.”

Up till the end of 1999, the Swedish Government has assigned a total financing of 55,6 Million Swedish Kronor (SEK)<sup>3</sup> to non-proliferation support. In addition, the Swedish Nuclear Industry and the Swedish Authorities have provided expertise and access to and use of facilities, most often without cost to the Programme.

This report deals solely with the non-proliferation support programme.

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<sup>1</sup> Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Kyrghyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

<sup>2</sup> Estonia, Latvia, Lithuania.

<sup>3</sup> 1 SEK = ca 0.12 Euro (June 2000)

## EARLY ACTIVITIES

When the former republics of the Soviet Union were established as the eleven NIS and the three Baltic States, the conditions for control of nuclear material (in particular plutonium and uranium) was considerably changed, both in these fourteen States and in Russia. It is a generally accepted opinion, that the current situation in Russia and several NIS is characterised by destabilised social order, and that the former strict, centralised communistic control of both civil and military nuclear facilities, has been relaxed and not fully replaced by an effective regime for nuclear material accountancy and control. The dismantling of major portions of the nuclear weapons programme has led to lay-off of highly competent scientists and technicians. Corruption within official organisations and institutions is also a factor of concern, which makes prevention of criminal activities difficult. This has led to an increased risk of illicit trafficking, i.e. theft from nuclear facilities and smuggling of nuclear materials or equipment that could be used for the manufacturing of nuclear weapons.

Both Russia and those NIS that had nuclear activities were lacking the necessary infrastructure for establishing and maintaining an effective and reliable non-proliferation control. The NIS and the Baltic States prepared early for becoming parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)<sup>4</sup>. They therefore needed to familiarise themselves with the commitments and requirements that follow with the NPT and the adherence to the international non-proliferation regime. It was then natural for them to call for assistance from countries that already had experience from international safeguards and non-proliferation implementation.

The first contacts, with the purpose to establish co-operation in the non-proliferation field, between the SKI and the NIS took place already at the end of 1991, and with Russia in 1992. Sweden's long-time active engagement in nuclear non-proliferation, as well as its large nuclear power programme, could offer competence and capacity resources well suited for support and co-operation activities, covering the entire nuclear area. Being a neighbour State in the Baltic Sea region, Sweden had several (political, safety and security) reasons for getting engaged in the task of assisting the NIS and the Baltic States to qualify for joining the international non-proliferation regime.

At an early stage, the SKI arranged a number of informal seminars and meetings in Sweden with people from governments, parliaments, authorities and nuclear facilities in the NIS and the Baltic States. Visits were also paid to Swedish nuclear power plants and the fuel fabrication plant. The purpose was to share with the recipient States the Swedish industry's and authorities' experience from and knowledge of nuclear non-proliferation and safeguards, including the application of international treaties, agreements and conventions.

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<sup>4</sup> During the period 1991 to 1994, 13 of the new States ratified the NPT.



## B. PROGRAMME OVERVIEW

### PROGRAMME OBJECTIVES AND GOALS

When SKI's support and co-operation programme was first initiated in 1991, the prime objective was to assist States in preparing for becoming parties to the NPT and to safeguards agreements with the International Atomic Energy Agency (IAEA). By January 1997, all fourteen States had ratified the NPT, and by November 1998, all States, but Tajikistan and Turkmenistan, had safeguards agreements in force with the IAEA.

Another reason for initiating early co-operation and support activities was the concern about the frequency of illegal trafficking of nuclear material, originating from nuclear facilities in the former Soviet Union.

An overall goal of SKI's support and co-operation programme is to accomplish means and measures, in the recipient States, for control and protection of nuclear material, equipment and facilities, so that the risk of further proliferation of nuclear weapons is minimised. This is done on request by and in co-operation with the recipient States.

The main objective of SKI's support and co-operation programme with a State is to assist in developing, implementing and maintaining the four basic components of the international non-proliferation regime, namely:

- a national non-proliferation **infrastructure**, i.e nuclear legislation (basic nuclear laws and other laws, ordinances, regulations, rules and guidelines) and the establishment of national nuclear authorities;
- a nuclear material **control system**, i.e. an administrative and technical system for the control of inventory and inventory changes of all nuclear material in the State, by means of recording and reporting; the State must have a *State System for Accountancy and Control (SSAC)* for fulfilling its obligations in accordance with the safeguards agreement with the IAEA;
- a sufficiently high level of **physical protection** of nuclear facilities and nuclear material against theft, sabotage and acts of terror;
- a system for **export and import control** of nuclear material and equipment, including dual-use items<sup>5</sup>.

In addition, the SKI is assisting States in developing and implementing

- systems to prevent, detect and combat **illicit trafficking** of nuclear material, other radioactive material, nuclear equipment, technology and know-how, which can be used for the manufacturing of nuclear weapons.

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<sup>5</sup> Dual-use items are equipment or non-nuclear materials that could be used in both non-nuclear activities, as well as for the production of nuclear weapons.

## IMPLEMENTATION STRATEGY

When support activities are initiated in a recipient State, the prime emphasis is laid on the transfer of knowledge and information concerning general non-proliferation matters to people in leading positions at nuclear authorities, parliaments, ministries and nuclear facilities. Throughout the support and co-operation programme, education and training of staff are always given high priority. People from facilities and nuclear and law enforcement authorities participate at seminars, work-shops and training courses, organised by the SKI both in Sweden and in the recipient States. Technical experts, mainly external consultants to the SKI, with specialist competence, but also SKI staff with non-proliferation experience, are engaged as lecturers and teachers.

The co-operation and support activities are organised in **projects**. Each project is referred to a specific country. In the case of nuclear legislation, there are also common projects, covering several countries. This has been done through the International Group of Legal Experts (ILG) that has Swedish Chairman and Technical Secretary, and members from Australia, Norway and Finland.

The objective and goal for each project is formulated by the SKI together with the recipient State, with the purpose to establish and maintain modern national systems for nuclear material accountancy and control, physical protection and export/import control; all based on modern (Western) legislation.

For the implementation of national systems, modern technique and methods are applied, based on advanced experience, mainly from the Swedish nuclear industry. Components of the national systems include:

- computerised accounting and reporting of inventories and inventory changes of nuclear material, including computer hardware and software;
- measurement equipment for nuclear and other radioactive material;
- mechanical and electronic equipment and devices for monitoring and protection of nuclear facilities, storage and transports;
- border control procedures and equipment.

A typical project scope comprises:

- advice on the structure of a national system, including distribution of responsibilities, the application of modern systems of quality assurance, internal control and safety culture;
- transfer of knowledge, instruction and training on all matters relevant to the development, implementation and maintenance of the national systems;
- the supply of certain equipment (computers, instruments, security devices, etc.), including maintenance during a limited time period, and training to use the equipment.

When deciding the scope of a project, the SKI is applying a “package principle”, i.e. the scope covers system design, hardware and software, education and

training, and also maintenance and support during, at least, a three year period, after the system has been implemented.

The SKI staff is responsible for the management and implementation of the projects. In specific areas, the SKI is using a selected group of Swedish consultants with specialist competence and experience. The major consultant firms are:

- AMC Konsult AB: develops computer programmes for nuclear material accountancy and control;
- ANS AB: specialists on physical protection systems and techniques;
- Göran Steen Konsult AB: law and legislation expertise;
- Safetech Engineering AB: systems for nuclear material accountancy and control and quality assurance;
- Proment Ltd: management and organisation development; information technology;
- Uppsala University, Department of Peace and Conflict Research;
- ILG Consultant Ltd: technical and scientific secretary functions.

The Swedish nuclear industry (i.e. power reactor manufacturer, and private and State power utilities) is also engaged by the SKI in different support projects, by providing experts and access to facilities for demonstration purposes. Furthermore, the SKI is co-operating with other Swedish supervisory and law-enforcement authorities for the planning and implementation of support projects, such as the Swedish Customs Head Office and the National Inspectorate of Strategic Products (ISP).

## PRIORITIES

When giving priority to the different support activities, the SKI is, among others, considering the strategic value, from a safeguards and non-proliferation point of view, of the nuclear material and equipment involved in the different States. Furthermore, the global consequences of illicit trafficking of the material in question, which is independent of the country of origin.

On basis of the support programme objectives described above, the projects are organised in five **Project Groups**, namely:

- Nuclear Legislation, including basic legislation, regulations, rules and guidelines; and the establishment of authority structures;
- Nuclear Material Control;
- Physical Protection;
- Export/Import Control;
- Combating of Illicit Trafficking.

Instruction and training, as well as the supply of equipment (e.g. computer hard- and software and security equipment and devices), is referred to each project group.

The combating of illicit trafficking has been added as a separate project group (during 1999), following the increased international concern over the risk of theft and smuggling of nuclear material and equipment and radiation sources, mainly from facilities and storage sites in the former Soviet Union. The background for this is thoroughly discussed in the SKI Report 00:3 "Report on Combating of Illicit Trafficking", which was published in Stockholm in January 2000.

Measures and means for the combating of illicit trafficking are established as a combination of the elements of the other project groups. There are certain recipient States with small or no nuclear energy programmes. Because of their geographical location, they may however be considered as "key-states" with respect to the potential risk of illicit trafficking. Furthermore, all States have radiation sources, used in medical and industrial activities, and such sources might also be subject to illicit trafficking.

The priorities of the support projects are determined with respect to the specific need and request from the recipient State and with consideration given to support from other donor countries and to the State's international obligations.

## PARTNERS IN RECIPIENT STATES

SKI's co-operation partners in the recipient States are those State organisations that have been assigned, by their respective Government, the supervision and control responsibility in the nuclear energy area. All support and co-operation activities sponsored by the SKI are carried out on the request by and in co-operation with these authorities.

## INTERNATIONAL CO-OPERATION

Several other countries are offering support to the former Soviet Union republics in their efforts to establish modern systems for nuclear material control and physical protection. Besides Sweden, early donor countries were USA, United Kingdom, Japan, Finland and Norway. Other countries with support programmes are France, Australia and the Republic of Korea.

At an early stage, the SKI approached the IAEA and proposed that support activities by different countries should be co-ordinated in order to avoid duplication. Another reason for co-ordination is that the overall value of the different contributions can be increased, if they are integrated under the overall

objective of a State's national system for nuclear material control, physical protection and export/import control.

In order to underline its proposal, the SKI prepared draft plans for a co-ordinated international support effort. This planning took place during the period mid 1993 to mid 1994, in co-operation with both recipient and donor countries. The draft plans were distributed by the IAEA and were commonly agreed upon. On basis thereof, the IAEA established a "Co-ordinated Technical Support Plan" (CTSP) for each recipient State. The plan identifies the need of support and which resources that should be made available by the different donor countries. It also confirms the support commitments, made by the donor countries. The plans are up-dated annually by the IAEA and constitutes a good basis for (voluntary) co-operation between the donor countries.

There is also a certain co-ordination between the European donor countries and the European Commission (EU). The EU funds TACIS and PHARE have relatively small projects related to nuclear material control. The SKI is co-operating with the EU Joint Research Centre (JRC) ISPRA in Italy on some TACIS projects, notably at the nuclear fuel fabrication plant Ulba in Kazakstan and at nuclear power reactors in Russia.

Furthermore, the SKI has technical and economical co-operation with Norway in some support projects in Russia and Latvia, with Japan in Belarus and Ukraine, and with Finland in Ukraine.

## RESULT CRITERIA AND REVIEW

The requirements on performance and quality of national systems for nuclear non-proliferation are clearly stipulated in international legal instruments (treaties, conventions, agreements), to which a State is committed as a signatory. These instruments are:

- the Treaty on the Non-Proliferation of Nuclear Weapons (NPT);
- the Safeguards Agreements with the IAEA, (based on IAEA document INFCIRC/153 corrected), including the Additional Protocol to the Agreement for the Application of Safeguards (INFCIRC/540 corrected);
- the Convention on Physical Protection of Nuclear Material (IAEA INFCIRC/274/Rev. 3) and the IAEA Recommendations on the Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev. 4);
- the Guidelines and Trigger List of the Nuclear Suppliers' Group (NSG), published by the IAEA in document INFCIRC/254, as amended.

The review of the result of a support programme project, with respect to completeness and quality, can thus be done on basis of well-known performance criteria. SKI's own review is based on a comprehensive experience and know-how of supervision and control systems for possession, use, transport, trade and protection of nuclear material and equipment. SKI's specialist competence is used as a means of quality assurance, in the field, with the purpose to determine if the recipient State will be able to fulfil its non-proliferation obligations.

For the projects related to nuclear material accountancy and control, there is also a further way of (independently and objectively) reviewing and judging the result, namely through the safeguards inspections carried out by IAEA's Department of Safeguards. An efficient audit and verification by the safeguards inspectors is dependent on a well functioning system of record keeping and reporting, both at the nuclear facilities and at the State authority offices. The feedback from the Department is, therefore, a useful tool in checking how well a national SSAC is working.

## **C. OVERALL GOALS AND ACHIEVEMENTS**

### **NUCLEAR LEGISLATION**

Nuclear legislation is the basis of all nuclear non-proliferation activities. For supervision and control of the implementation of and the adherence to the legislative requirements, it is essential that a State legislative and authority infrastructure is established, which meets with modern principles of responsibilities, quality assurance, safety culture and internal control. All co-operation and support projects related to nuclear legislation are, therefore, given a high priority in the Swedish Programme.

The requirements of and commitments to the international legal instruments (treaties, conventions and agreements) for nuclear non-proliferation must be stipulated in the national laws. In addition to a basic nuclear law, a State that has nuclear facilities and activities must also develop rules and regulations for the controlled possession, handling and use of nuclear and other radioactive material.

Right from the beginning, a significant effort of the Swedish Support Programme has been devoted to the review of existing legislation in the recipient States and to proposing improvements and amendments. In order to broaden the basis for the legislation support and to promote the co-operation between donor countries, the SKI took the initiative in 1994 to establishing the International Group of Legal Experts (ILG). A further reason for this approach was to promote the harmonisation of the nuclear legislation between the recipient States.

The ILG has a Swedish chairman and a Swedish technical secretary, and the other members are from Australia, Norway and Finland. Between 1994 and 1998, the ILG had a close co-operation with the Legal Division and the Technical Co-operation Department of the IAEA. The ILG reviews and analyses drafts of new legislation that have been prepared by the recipient States. It suggests improvements and amendments and gives advice, also on matters concerning authority structures and procedures.

With the purpose to provide guidelines for the legislative content and structure, the ILG has established a series of concept laws, covering Basic Nuclear Legislation, Licensing, Physical Protection, Export/Import Control, and Nuclear Material Accountancy and Control (Safeguards). The goal has been to introduce simple and clear legal principles into the national legislative system. A recommended approach has been to build a legislative system with a core or frame law, supplemented by ordinances and regulations. Furthermore, obligatory licensing for all nuclear activities, and the use of punitive measures in case of deviations from requirements.

Beginning in 1994, the ILG has assisted in preparing draft basic nuclear laws in Kazakstan, Lithuania, Belarus, Georgia, Armenia and Moldova (in chronological order). With Ukraine, the ILG has had its most comprehensive co-operation

programme and has been engaged in the review of draft laws and regulations on physical protection, radiation protection and export/import control. In Latvia and Russia, the co-operation has focused on nuclear regulations.

Legislation work is a lengthy process, considering the reviews and evaluations that have to be done by several institutions and organisations, before a final draft law can be presented to the Government and further on to the legislators (Parliament) for debate and final approval. Experience shows that this process is particularly difficult in the case of the former Soviet republics, where the development of a modern legislative structure has to overcome both technical and political hurdles.

Technically, the problem is mainly focused on the change of the administrative infrastructure of decision making from the top-down, authoritarian system, to a modern (“parliamentarian democratic”) safety-in-depth philosophy with clear lines of responsibilities, including that of the individual, internal control, safety culture, etc. On the political side, one of the most important changes facing the legislators concerns the role of an “independent” State regulatory body. This is an essential feature of a modern legislative structure, developed for meeting the requirements on nuclear safety, security and non-proliferation.

In order to support and promote the process of introducing new nuclear legislation, the ILG has been engaged in talks with ministries and Parliamentary committees in most of the States in which legislation co-operation programmes have been carried out. This has been of particular significance in Ukraine, where all ILG working meetings in Kiev with the Nuclear Regulator Authorities are followed by meetings with representatives of the Parliament Committee for Fuel and Energy Complex, Nuclear Policy and Safety. The basic principles that form the corner stones of the nuclear legislation system have also been the subject of lectures by the ILG Chairman at several seminars and workshops arranged by the SKI over the years.

## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

A State that accedes to the NPT will have to sign a safeguards agreement with the IAEA, which commits the State to establishing a State System of Accounting for and Control of Nuclear Materials (SSAC). A strong SSAC is the primary deterrent to theft and illicit trafficking of nuclear material. Material accounting and control is designed to assure that the location and amount of all nuclear material in a State is known and confirmed through periodic inventory takings.

In its elementary form, the SSAC is based on manual routines for the recording and reporting of nuclear material inventories and inventory changes. The large quantities of nuclear material in power plants, storage facilities, and fuel fabrication plants require, however, the use of computerised routines. Under the Swedish Support Programme, computer programmes have been developed and implemented for recording and reporting routines for inventories and



inventory changes. Such programmes have been installed both at facilities and at the State authority head offices in recipient States.

For the support projects, experience of the Swedish accountancy and control system has been used. It has, however, been necessary to develop new computer programmes and adapt them to each facility individually.

The computer programmes are used for generating three kinds of records and reports respectively, in accordance with the requirements of the safeguards agreements with the IAEA:

- a General Ledger that is maintained both at the facility and at the State authority;
- a Physical Inventory List that is used both for reporting to the authority and as a reference document at the safeguards inspections by the IAEA;
- Inventory Change Reports from the facilities to the State authority and to the IAEA.

Under the Swedish Support Programme, computer programmes have been developed and implemented at all four nuclear facilities in Kazakstan and at all (but one) facilities in Ukraine. In these States, computer programmes have also been implemented at the authority offices; details are reported in Chapter E below. In line with the aforementioned “package principle”, this has included both hardware and software, as well as training of staff, and maintenance, including necessary adjustments and improvements, during a period of, at least, three years. Computerised nuclear material control systems have also been developed and implemented at facilities and authority offices in Latvia, Lithuania and Russia.

Other support projects under the title Nuclear Material Accountancy and Control, have included the development of technical control measures for the internal control system at the Ulba fuel fabrication plant in Kazakstan, and the procedures for physical inventory taking. For the Ulba facility, quality assurance procedures have also been introduced and a Quality Assurance Manual has been worked out. Furthermore, a volume measurement system has been developed under a TACIS project together with ISPRA.

## PHYSICAL PROTECTION

The nuclear facilities, including both civilian and military storages and deposits, in Russia and the former Soviet republics are in many cases not sufficiently protected against theft, sabotage and terror actions. Frequent reports on illicit trafficking and smuggling indicate the potential risk of increased illicit trafficking and illegal manufacturing and use of nuclear weapons. The requirements for improved physical protection are, therefore, well justified.

The Swedish Support Programme includes several projects aiming at improving physical protection systems. Considering the large financial resources that are needed for the installation of such systems at nuclear facilities, and in particular at power reactor plants, it is evident that the support activities in this area are suitable for co-operation between donor countries. Such co-operation, with SKI participation, has been applied in four States, namely:

- in Latvia, where Sweden and USA have carried out a study over the need for improved physical protection systems at the research reactor Salapils;
- in Belarus, where Sweden and Japan have completed a joint project for the improvement of the physical protection system at the Sosny Technical Centre (STC);
- in Ukraine, where Sweden and Japan have installed a modern perimeter protection system at the Kharkiv Institute for Physics and Technology; and
- in Russia, where Sweden and Norway are co-operating in a project for the improvement of the physical protection system on nuclear propelled icebreakers at Murmansk.

Sweden alone has also contributed to improved physical protection at nuclear facilities and installations in Latvia, Lithuania and Russia.

Sweden, Germany and the United Kingdom jointly organised a seminar on physical protection in St Petersburg in April 1995 with participants from Russia and several of the NIS.

## EXPORT/IMPORT CONTROL

In addition to improved measures for nuclear material control and physical protection, improvements of procedures and routines for export/import control would also lead to a reduction of illicit trafficking. National export/import control systems should meet with the NSG Guidelines, and be based on relevant requirements incorporated in the national legislation.

The Swedish Support Programme has undertaken to assist the NIS in their efforts to implement export/import control systems. The initial phase of this work started with export/import control seminars in 1995 that were organised for participants from both Ukraine and Belarus. As a follow-up to those seminars, a seminar was held at the SKI in Stockholm in November 1999 with the topic broadened to cover all weapons of mass destruction.

Further support activities are needed in this area, and it is recommended to organise them in co-operation between donor countries and with customs control organisations.

## EDUCATION AND TRAINING

On the basis of the early experience from contacts with the NIS and the Baltic States, it was judged by the SKI that most of the people engaged in nuclear material control activities had a need for training in one or more subjects. The training segment of the Swedish Programme consists of both:

- basic training in nuclear non-proliferation issues, and
- topical training in specific subjects related to the different application areas of the nuclear control systems.

The basic training programme has included presentations and lectures on basic NPT principles and issues, on bi-lateral and international agreements, and on the principle design of and basic requirements on the control systems. This training has been addressed primarily to staff in leading positions and has been given in the form of seminars, both in Sweden and in the recipient States.

Topical training has been given to staff from both State authorities and nuclear facilities, in the form of training courses in Sweden and in the recipient States, and as group lectures at the facilities, e.g. in the use of computers and computer programmes.

During the period 1992 through 1999, the SKI organised 40 seminars and courses. In total, about 500 persons from authorities and nuclear facilities participated. In addition, SKI staff and consultants have lectured at several seminars and courses that were sponsored by other donor countries and the IAEA.

## COMBATING ILLICIT TRAFFICKING

Unauthorised or criminal trafficking in radioactive material, including nuclear material, is in accordance with internationally accepted terminology referred to as "Illicit Trafficking" of such material. Measures and means for *prevention and detection of and response to* illicit trafficking are, with a common term, referred to as "Combating Illicit Trafficking".

In December 1998, the SKI together with the Latvian Ministry of Environmental Protection and Regional Development (VARAM) and the Norwegian Radiation Protection Authority (NRPA) agreed to jointly carry out a project study of means and measures aimed at the combating of illicit trafficking. A Working Group was established, and a Reference Group with members from the three sponsoring countries and Finland.

The objective of the Study was:

- a) to investigate the different means and procedures, on the national and international level, that are essential for detecting and combating illicit trafficking. This includes, in the nuclear area, legislation, SSAC, physical protection, export/import control, radiation protection, as well as border and customs control and security police activities; and
- b) to identify actions within the various implementation areas that should be subject to improvement, and suggest how the network of involved State authorities and institutions can be developed to facilitate combating illicit trafficking.

For the purpose of the Study, illicit trafficking was defined as:

*Unauthorised, intentional activities, with or without crossing international borders, in the form of receipt, provision, possession, use, transfer or disposal of:*

- a) radioactive material, including nuclear material; or*
- b) nuclear items, including so called dual-use items, in the form of devices, components or equipment that can be used for the manufacturing of nuclear weapons; or*
- c) technology and know-how relevant to the manufacturing of nuclear weapons .*

In January 2000, the result of the Study was presented in the “Report on Combating of Illicit Trafficking” (SKI Report 00:03), outlining proposals for improvements of the current systems and procedures, both on the national and international level. During the first part of 2000, the Report has been presented by the SKI Support Programme Director at meetings with:

Latvia, Estonia, Lithuania, United Kingdom, USA, Russia, Japan and the IAEA. Furthermore, at the Illicit Trafficking Working Group (ITWG) meeting in Vienna in June 2000.

## D. EVALUATION

### GENERAL

The Swedish Support Programme on Nuclear Non-Proliferation has been in operation for almost a decade and an evaluation of the result and of the impact on the non-proliferation regimes in the recipient States should be done in that time perspective.

The programme activities under the different projects have been subject to a continuous review and evaluation by the Support Programme Management. Feed-back from project leaders and other contributors on the Swedish side concerning approach strategies, response from the recipient States, communication and transportation challenges in the field, etc. has helped to quickly solve problems and adjust and improve techniques, methods and means. In its administrating and leading role, the Management has always shown flexibility and willingness to adapt to changes and seek alternative solutions. This has been facilitated by the mere fact that the size of the engaged support staff from the SKI and its consultants has been rather modest and, therefore, easy to handle. Furthermore, the communication paths between Management and the executors in the field are clear and short and, as a whole, free from bureaucratic hurdles.

The consultants engaged in the Support Programme have been selected by the Programme Management among experts from the Swedish nuclear industry with high competence and long experience. Most of them have been linked to the Programme over its entire existence and are, from the side of the recipient States, often considered as SKI staff.

For some support projects, in particular concerning physical protection systems and measures, the work has been done in co-operation with other donor countries. In all those cases, the projects have been carried out in a friendly and co-operative atmosphere and the experience from such co-operation is positive.

Of particular value for a successful implementation of projects related to nuclear material accountancy and control has been the co-operation with the Safeguards Department of the IAEA and the useful advice and feed-back information received. The Safeguards Department has also contributed with lecturers and instructors at some seminars and workshops arranged by the SKI.

### TRANSFER OF KNOWLEDGE AND KNOW-HOW

A major component of the Swedish Support Programme is the *transfer of knowledge and know-how*. Not only with respect to the operation of computers and the use of instruments and equipment, but in particular concerning the structure and operation of the “national nuclear complex” of a country, involving

executives, authorities, operators and the public. To give such transfer real substance and credibility, it has been the ambition of the Project Management to seek to create a spirit of confidence between equal counterparts, in particular on the management level. This has led to the establishment of fruitful and useful personal contacts between individuals in Sweden and in the recipient States, to the benefit of an efficient and successful implementation of Programme activities.

Whenever the Programme has been initiated in a “new” State, the first activities have been focused on arranging seminars for people in leading positions from concerned authorities, facilities and institutions. In connection thereto, visits have been paid to Swedish nuclear facilities and authorities and informal exchange-of-information meetings with Swedish colleagues have taken place. This has been made possible thanks to a positive and accommodating attitude from the side of the Swedish nuclear industry.

The background and importance of an effective international non-proliferation regime, based on the NPT, has been an essential topic at those high-level seminars and work-shops, in particular when legislators in ministries and parliaments have been addressed. The social and infrastructure factors of a national safety culture, both in the nuclear safety and non-proliferation area, as well as the democratic and parliamentary components of a modern and free society have also been subject to study and discussion at those occasions. Furthermore, much attention has been assigned to environmental protection questions and demonstrations of the Swedish model for this important feature of a modern nuclear industrial society.

## THE LEGISLATION FOUNDATION

Several of the recipient States are small countries, like Sweden, and this fact would be reflected in the way “a small-scale” administrative structure and network between authorities and users/operators are developed. This is valid also for the structure of the nuclear legislation, for which the Swedish model of a nuclear framework law and regulations developed by independent nuclear authorities has been used as a reference by the Support Programme. All States in which legislation support projects have been implemented through the International Group of Legal Experts, have responded to that approach in a positive and receptive way.

In the ideal case, the basis for a modern national system for non-proliferation, as well as for nuclear and radiation safety, should be a complete set of laws and regulations that are developed and implemented in a joint effort by all parties concerned. The ILG has repeatedly and energetically preached the gospel of the importance of laying the “cornerstones” of the legislation foundation, i.e. clear and understandable legal requirements concerning responsibilities, independence, safety culture, internal control and quality assurance, based on the requirements imposed by international treaties, agreements and

conventions. This message has been addressed to both politicians (in parliament committees), executives (in ministries) and management staff of supervisory and controlling authorities.

In order to consolidate the legislative structure and to stimulate the interest for and understanding of the requirements and responsibilities facing a State that volunteers to adhere to the international non-proliferation regime, the Swedish Support Programme has promoted the establishment of two institutes for nuclear legislation and non-proliferation research, one in Ukraine and one in Kazakstan. The continuous contacts with and support to these institutes are highly motivated, considering their role as centres of co-operation and communication.

## PACKAGE APPROACH

An overall objective of the Swedish Support Programme is to help each recipient State to be able to, independently and without help from outside, take the full responsibility for operating a national non-proliferation system and thereby fulfil the requirements imposed through the international legal instruments. This would include both the development and implementation of a modern nuclear legislation system, and the establishment of the components making up a national system for combating illicit trafficking.

This *package approach* is reflected in the five Project Groups (i.e. nuclear legislation, nuclear material control, physical protection, export/import control, and combating of illicit trafficking), which together cover the entire non-proliferation area and illustrate the overall Programme scope. The Programme activities are, with few exceptions, designed to be parts of that overall scope, and not as isolated or specific activities.

The scope and objective of the support projects are worked out in consultations between the SKI and the State counterparts with the overall goal in mind, but taking into account the specific circumstances and conditions of each single State. This means for example, that for States that have no nuclear power programme, not all project groups will have to be included in the State's programme.

## RESULT EVALUATION

The immediate result and achievements of many Swedish Support Programme activities cannot be reported in figures or put into a simple proportional relation to the money spent. To what extent the transfer of knowledge and know-how improves the nuclear "competence" of the recipient States might be judged by observing and communicating with the States over a longer period. Maintaining the communication and co-operation links that are established through the

Programme between counterparts in Sweden and the recipient States, makes this possible and would, in addition, promote the overall strengthening of the international non-proliferation regime.

Another means of judging the result of the support activities is the direct observation of to what extent and with what pace the States are implementing legislation and systems required by the international legal instruments, i.e. the NPT, the Safeguards Agreements, the Convention on Physical Protection, and the export/import control criteria according to the NSG. This is done partly by SKI's own peer reviews in the field, and partly by IAEA's Safeguards Department at inspections and, in the case of physical protection, at expert missions by the International Physical Protection Advisory Service (IPPAS).

It is easier to evaluate the result of the support activities in the area of nuclear material control. Computer programmes for nuclear material accountancy and control, based upon the Swedish system but adapted to the specific conditions in recipient States, have been installed and are in operation:

- at the State authority offices in Ukraine, Kazakstan, Lithuania and Latvia;
- at all NPPs, but one, and two nuclear R&D facilities in Ukraine;
- at all R&D nuclear facilities in Kazakstan;
- at the NPP in Lithuania; and
- at the Murmansk Shipping Company in Russia.

The systems have, or are being, up-graded to the 3<sup>rd</sup> generation, meeting the new and increased information requirements by the IAEA.

Contributing to the successful operation of these systems are the continuous contacts and communication, over several years, between the Swedish system designers, on one side, and the State authority staffs, the facility operators and the IAEA safeguards inspectors and information technology staff, on the other side.

The hard-ware related support projects in the area of physical protection have mainly been assigned to the Sosny Nuclear Research Centre in Belarus and the Kharkiv Institute for Physics and Technology in Ukraine and at some facilities in Russia. In all cases, physical protection equipment and devices have been installed and taken into operation in accordance with agreed project plans and specifications. The problems have mostly been to overcome bureaucratic hurdles., in connection with import permits and customs clearances of equipment.

## OVERALL RESULT

The change of the nuclear structure in Russia and in the former Soviet republics, from the old communistic, totalitarian system into a modern, Western system, based on democratic parliamentarism, is a slow process, indeed. The



implementation of improvements, both concerning procedures and responsibilities and in the form of equipment and security devices, is furthermore hampered by limited financial and human resources. This explains why the support has to be given and maintained over a long time period, until the overall goal is attained. For computerised material control systems and for physical protection installations, developed and installed under the Support Programme, the Swedish commitment includes service and maintenance of the equipment for a period of, at least, three years.

It can, however, be argued that a decade (which is approximately the duration of the Swedish Support Programme so far) is not a too long period to build new State structures in such a technically and politically complicated area as the nuclear, considering the difficult conditions at the starting point.

It is the convinced understanding and opinion of the Swedish Support Programme Management that the recipient States are seriously motivated and are carrying out an ambitious work to develop and improve their national non-proliferation regimes, in spite of their shortcomings concerning financial and human resources. For those States, with which Sweden has established support and co-operation programmes with "full-scope" non-proliferation objectives, it is judged that the goals reached, up till now, are very satisfactory, and that the States in question have come a long way towards the fulfilment of international requirements.

## FUTURE ACTIVITIES

During the second half of 2000, the Support Programme will enter a third phase, and the future Programme plans are currently under consideration. Assuming, however, that the annual financial funding from the Swedish Government, for 2000 and onwards, will remain the same (i.e. about 22 Million SEK per year), the following approach can be outlined, in broad terms.

The time until the currently defined overall project goal is assumed to be reached in the NIS and the Baltic States is estimated at four to five years.

For Kazakstan, the support projects are planned to continue to cover the entire non-proliferation area. For the other States in Central Asia and Caucasus, i.e. Uzbekistan, Kyrgyzstan, Tajikistan, Azerbaijan, Armenia, Georgia, as well as Moldova, the support activities might mainly be focused on means and measures for the combating of illicit trafficking.

For Ukraine, Estonia, Latvia and Lithuania, the support is planned to comprise the entire non-proliferation area, but emphasis will be laid on the combating of illicit trafficking. For Belarus, that is now a member of the Nuclear Supplier's Group, the support is planned to also include export control matters.

For Russia, the support and co-operation programme is planned to continue over the entire non-proliferation area, with an emphasis partly on the transfer of knowledge and know-how and the strengthening of authority responsibilities and structures, and partly on systems of control and security of nuclear material. In addition, support projects would be assigned to specific facilities in cases where the support would be considered as a part of the transfer of knowledge.

## E. PROJECT DESCRIPTIONS

### E.1 On-going Projects and Projects Completed during 1999 and 2000

<b>THE RUSSIAN FEDERATION (RUSSIA)</b>
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**Co-operation partners:** The Federal Nuclear and Radiation Safety Authority of Russia, Gosatomnadzor (GAN).

The State Ministry for Atomic Energy (MINATOM).

The State Ministry of Defence.

The first co-operation activities between the SKI and Russian nuclear authorities were initiated in 1992 and concerned mainly nuclear material accountancy and control at a fuel fabrication plant. Because of not clearly defined responsibilities between the different Russian nuclear authorities at the time, the co-operation was deferred in 1993, but resumed in 1995. A governmental agreement between Sweden and Russia on co-operation in the nuclear field was concluded in December 1997.

Gosatomnadzor (GAN) has been SKI's major partner already from the beginning of the co-operation programme with Russia in the area of nuclear non-proliferation. GAN's head-office is in Moscow and it has eight regional offices. Most of SKI's co-operation and support projects are linked to the north-west region, with office in St Petersburg. The overall objective of the Swedish programme has been to strengthen the role of GAN as the State regulatory and supervisory body in the entire area of nuclear non-proliferation management, i.e. material control, physical protection and export/import control.

In the early stage of the co-operation programme, priority was given to projects aiming at the improvement of the authority structure and the development and implementation of fundamental regulations for the State supervision of non-proliferation means and measures, including legislation. Further projects have been focused on specific needs of new or improved non-proliferation measures at single facilities or locations, such as Murmansk, Arkhangelsk and the Ural region.

With the purpose to facilitate an effective and smooth implementation of the support projects, the SKI has established communication and co-operation relations also with other governmental institutions, directly linked to the nuclear objects that are subject to the support projects. These are the State Ministry for

Atomic Energy (MINATOM), that has the function of owner and operator of a major part of the Russian nuclear programme, and the State Ministry of Defence.

Some of the support projects are carried out in co-operation with the Norwegian Radiation Protection Authority (NRPA), in accordance with an agreement between the SKI, the NRPA and GAN, concluded in February 1998 (the so called "Sigtuna Protocol").

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#### NUCLEAR LEGISLATION

<b>Project RYS 98/2</b>	<b>State Regulations on Non-Proliferation Matters</b>
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UD 98/1488/EC	SKI Dno. 1.652/990124
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**Objective:** To assist GAN to prepare new State regulations on non-proliferation matters.

The development of new or improved State regulations is one of the most important steps towards the establishment of a modern structure of nuclear safety and non-proliferation. With the large number of nuclear facilities in Russia, representing all areas of nuclear activities, the work to transform the State control system would be facilitated by a set of regulations directed at the objects (facilities) under GAN's supervision.

Swedish technical and legal experts co-operate with Russian authority staff. The Russian side prepares draft regulations and the Swedish experts are reviewing the drafts and are proposing improvements and supplements. Both technical and legal aspects are considered, reflecting the long-term experience in Sweden from related problem complexes.

The work focuses on four areas, namely nuclear material control, physical protection, licensing and export/import control.

**Status:** On-going.

**Financing:** 329 000 SEK

## NUCLEAR LEGISLATION

<b>Project RYS 99/1</b>	<b>Basic Nuclear Legislation</b>
SIDA 363/99	SKI DNo. 1.652/990990

**Objective:** To assist GAN to prepare new drafts of nuclear legislation and regulations.

This project is a direct continuation of Project RYS 98/2.

The first legislation support under the SKI-GAN co-operation and support programme is completed. It comprised a review of the basic nuclear legislation and the identification of needs for a modernisation and for amendments of laws and regulations in the non-proliferation area, to be in accordance with the requirements to which Russia is committed through the international legal instruments concerning non-proliferation.

Project RYS 99/1 focuses on the development of authority regulations and rules, taking into consideration the necessary changes and amendments of the basic legislation that was identified in the initial support project. The emphasis is laid upon the importance of the authority regulations as a tool for implementing the requirements related to non-proliferation (i.e. nuclear material control, physical protection and export/import control, including licensing).

In co-operation with staff from the GAN Head-Office, the Chairman and Technical Secretary of the ILG are co-ordinating and leading the detailed review of existing legislation and drafts of new or amended laws, regulations and rules. The ILG is analysing draft legislation and is giving advice and comments for improvements that may lead to acceptance and implementation. Reference and background information is also given to members of Parliament and concerned institutions and committees. This is done in support of the evaluation and decision process.

The constituent meeting on ILG-GAN co-operation took place in Moscow in April 1998. At the fourth ILG-GAN working meeting, that was held in Moscow in June 1999, items related to nuclear material control system regulations, physical protection and combating illicit trafficking were dealt with.

**Status:** On-going.  
Next working meeting (the fifth) is scheduled for Summer 2000 in Stockholm.

**Financing:** 689 000 SEK

## NUCLEAR LEGISLATION

<b>Project RYS 98/3</b>	<b>Legislation applied on so called Excess Material</b>
UD 98/1488/EC	SKI DNo.1.652/981359

Objective: To prepare a proposal for legislation applied on “excess material”.

The disarmament programme for nuclear weapons in Russia leads to the recovery of considerable quantities of weapons grade nuclear material (uranium and plutonium). Part of that nuclear material will be separated out of the military programme and be put under international control as so-called “excess material”. On the national level, the excess material will be under the supervision of GAN. Currently, there is no legislation regulating this transmission process.

The purpose of the Project is to prepare a proposal for new legislation that will ensure the State control of the excess material (of nuclear weapons grade) under the supervision of GAN. The project is carried out in a committee under the chairmanship of a member of the Parliament (the Duma) and with vice chairmen appointed by GAN, the SKI and the NRPA. An SKI legal consultant is chairing an advisory group of legal experts. The project has also a Reference Group, chaired by the SKI, that is following-up on the entire project.

The Project is carried out in co-operation with the NRPA.

**Status:** Completed.

**Financing:** SKI 556 000 SEK  
NRPA 450 000 NOK (Norwegian Crowns)

## NUCLEAR MATERIAL CONTROL

<b>Project RYS 99/4</b>	<b>Equipment for GAN s Office in the Ural Region in Jekaterinburg</b>
SIDA 363/99	SKI DNo. 1.656/981414

Objective: To improve GAN’s control and supervision system.

A new facility for storage of spent nuclear fuel from Murmansk and Arkhangelsk Oblasten is being erected by MINATOM in the Mayak area of the Ural region. The State Regulatory Body responsible for control and supervision of the licensing conditions for construction and operation of the facility is the GAN regional office for Ural, situated in Jekaterinburg. Because of limited resources, this office is working under very unsatisfactory administrative and logistic conditions.

The objective of the Project is to improve the ability of the GAN Ural Office to carry out an adequate supervision and control of the new facility. The Project is divided into three phases:

- Phase 1: Supply of office equipment, including computers and software, and relevant education and training of staff;
- Phase 2: Improvement of the security system of the GAN Ural Office, in particular, in those localities where the delivered equipment is going to be used;
- Phase 3: Development of methods and procedures concerning the implementation of GAN's control and supervision activities, through the use of regional information systems, including related education and training of staff.

Project RYS 99/4 covers only Phase 1.

The SKI is carrying out Phase 1 in co-operation with the NRPA.

**Status:** Phase 1 completed.  
The equipment was delivered and installed at the GAN Ural Office in April 2000.

**Financing:** SKI            554 000 SEK  
                  NRPA            410 000 NOK

#### NUCLEAR MATERIAL CONTROL

<b>Project RYS 99/5</b>	<b>Management and Organisation Development at the GAN St. Petersburg Office</b>
SIDA 363/99	SKI DNo. 1.657/990680

**Objective:** To improve GAN's management competence.

The objective of the Project is to improve the administrative competence of, in the first place, the GAN Office for the north-west region, situated in St. Petersburg (GAN-NED). Focus is laid on "modern management" and on quality improving procedures related to the tasks and responsibilities of a State Regulatory Body in the licensing process of supervision and control.

The SKI has arranged three seminars on Quality Assurance: in Stockholm (3 days in June 1999) and in St Petersburg (2 days in October 1999 and 2 days in April 2000).

**Status:** On-going.  
A plan for the further project work was established at meetings in June and October 1999. The plan covers the activities by the

Russian and the Swedish participants respectively for the development of a system for quality assurance. The work is progressing in accordance with the plan. During the third meeting in April 2000, the work was focusing on Quality Assurance aspects of GAN's control of equipment to be used in nuclear facilities. Further items to be discussed include licensing and inspection activities.

**Financing:** SKI           742 000 SEK  
                   NRPA         250 000 NOK

#### NUCLEAR MATERIAL CONTROL

<b>Project RYS 99/6</b>	<b>Instruction of GAN Inspectors</b>
SIDA 363/99	SKI DNo. 1.657/991234

**Objective:** To instruct and train GAN inspectors in the use of CVD equipment.

The generally applied method for verification of spent nuclear fuel is based on the so-called Cherenkov effect, and the equipment used by inspectors (advanced camera devices) is called Cherenkov Viewing Device (CVD). The use of the equipment is rather complicated and only well prepared and trained inspectors can expect to obtain an adequate and successful result when using this verification method.

GAN expressed a wish to have some of its inspectors trained in Sweden on the use and handling of the CVD equipment. Those inspectors could later be engaged as instructors for other GAN inspectors in Russia.

The training course was arranged, as planned, in January/February 2000 at the CLAB facility in Oskarshamn, with 8 participants from GAN, Rosenergoatom and Minatom. Two Russian-speaking instructors and the course co-ordinator were provided by the IAEA Safeguards Department.

**Status:** Completed.

**Financing:** 659 000 SEK



## NUCLEAR MATERIAL CONTROL

<b>Project RYS 99/9</b>	<b>Registration and Control System for Navy Nuclear Fuel</b>
SIDA 363/99	SKI DNo. 1.653/991232

**Objective:** To improve the nuclear material accountancy and control system for nuclear fuel used by the Russian Navy.

Fresh nuclear fuel for the Russian nuclear submarines is stored at the submarine shipyard Sevmash at Severodvinsk (near Arkhangelsk). Part of the fuel is nuclear weapons grade material. The accountancy and control system is archaic and does not meet adequate requirements on security and protection. It needs, therefore, to be modernised and upgraded. Before that is done, the risk for uncontrolled access to and illegal use of the material is evident.

The computer programmes that have been developed by the SKI for the Murmansk Shipping Company (project RYS II.1) will be used as a basis for the Sevmash control system. The Project will include education and training of staff, both in the use of the software and for the control procedures.

**Status:** On-going.  
In December 1999, Swedish developed SSAC software for nuclear power plants and software for the Murmansk Shipping Company were demonstrated at the Kursk NPP and at the GAN Head-Office in Moscow. Representatives from Minatom participated. A further demonstration is planned for the second quarter of 2000.

**Financing:** 601 000 SEK

## NUCLEAR MATERIAL CONTROL

<b>Project RYS 99/10</b>	<b>Solving the Y2K Problem for the GAN Tele-communication System</b>
SIDA 607/99	SKI DNo. 1.656/991439

**Objective:** To secure the tele-communication system for the turn of millennium problem (Y2K).

On request by GAN in October 1999, the SKI undertook to assist in solving the Y2K problem for the GAN tele-communication system, and in particular, to have a "telephone exchange" component replaced. The component to be replaced had been delivered by the Swedish company Ericsson in 1994 and did not meet the millennium turn requirements.

The tele-communication system is used as the main link between GAN and all facilities that are under GAN's supervision. It is also used for "early warning and notification" in case of nuclear safety or non-proliferation incidents and accidents, in accordance with Russia's international commitments.

**Status:** Completed.  
The new equipment was delivered and installed in March 2000.

**Financing:** 468 000 SEK

#### PHYSICAL PROTECTION

<b>Project RYS 98/7</b>	<b>Physical Protection of Nuclear Fuel at Murmansk Shipping Company</b>
UD 98/1488/EC	SKI DNo. 1.654/990189

**Objective:** To improve the physical protection of the nuclear propelled icebreakers and service vessels.

This Project is a direct continuation of Project RYS-II.2 (UD 97/398/EC).

The Russian nuclear propelled icebreakers are stationed in the Murmansk area. The nuclear fuel is highly enriched uranium of weapons grade quality. The fresh fuel is stored on board service vessels, which are not adequately protected against criminal acts, such as theft, sabotage or terrorist attacks. The physical protection of the icebreakers is also incomplete. The risk is therefore, high that nuclear fuel, both fresh and spent, is lost in an illegal or uncontrolled way.

The Project objective is:

- to investigate and analyse the need for physical protection measures and systems, both for the icebreakers and the service vessels;
- to develop a proposal for a physical protection system, including mechanical system, electronic equipment and procedures;
- to support and supervise the implementation of the system with relevant know-how and experience from the Swedish nuclear industry.

The project is carried out in co-operation with the NRPA.

The Project has two phases:

Phase 1: investigation, analysis and proposal, i.e. proposals for physical protection of all three icebreaker models and one service/storage vessel;

Phase 2: implementation of equipment and procedures.

**Status:** Phase 1 is completed. The proposals have been approved by all relevant Russian authorities, including GAN.

Phase 2 is on-going.

The Murmansk Shipping Company (MSCo) has contracted the Moscow based company Escort Center to do the installation of the system. The first icebreaker (Sovjetsky Soujz) will have the installation completed in April 2000.

**Financing:** SKI                    1 068 000 SEK  
                  NRPA                    250 000 US Dollars per vessel

#### PHYSICAL PROTECTION

<b>Project RYS 98/8</b>	<b>Physical Protection at the Nuclear Submarine Shipyards at Severodvinsk</b>
UD 98/1488/EC	SKI DNo. 1.655/980209

**Objective:** To improve the physical protection of the fresh nuclear fuel.

This project is a direct continuation of project RYS-D.3.1 (UD 97/398/EC)

The two shipyards Sevmash and Zvyozdochka, situated at Severodvinsk near Arkhangelsk, are serving the nuclear submarines belonging to the Russian Northern fleet. Both shipyards are subordinated to the State Ministry of Defence. Fresh nuclear fuel of weapons grade quality is stored at the shipyards, in particular at Sevmash. The physical protection of the storage facilities for nuclear fuel and for radiation sources is inadequate and the risk for illegal or uncontrolled removal of material is high.

The project objective is to improve the physical protection system for the fresh fuel storage facilities, including the establishment of a control centre and upgrading of the perimeter protection, as well as instruction and training of staff.

The Project is planned for three phases:

Phase 1: Preparation of a proposal for a physical protection system for the fresh nuclear fuel, based on investigation and analysis of the existing system

Phase 2: Detailed plans and specifications;

Phase 3: To support and supervise the implementation of the mechanical system and electronic equipment.

**Status:** Phase 1 and 2 are completed.  
Phase 3 is resting.

**Financing:** SKI                    960 000 SEK

## COMBATING ILLICIT TRAFFICKING

<b>Project RYS 98/10</b>	<b>Measures for Combating Illicit Trafficking during Transports</b>
UD 98/1488/EC	SKI DNo. 1.656/980676

**Objective:** To improve the system for combating illicit trafficking of nuclear material during transport and intermediate storage.

An investigation study made under the Swedish support programme in 1998 (project RYS V.1 Export Control Routes), showed that all export of nuclear material from the north-west region is made under the control of "Izotop", which is a MINATOM enterprise. The vast majority of the export cases leave the country via the port of St. Petersburg, while the rest is shipped via the port of Arkhangelsk. In either case, intermediate storage of the material is made in the port areas, under the supervision of "Izotop" or, in the Arkhangelsk alternative, by two sub-contracted companies.

The material is inadequately protected for theft, sabotage or acts of terrorism, both during the transports and at the intermediate storage. Several incidents of illicit trafficking character have occurred.

The objective of the Project is to carry out a detailed analysis and evaluation of the physical protection conditions and to develop a proposal for a physical protection system for prevention, detection and response. The Project will also advise on procedures and manuals for both routine and incident situations. This is Step 1 of the Project.

Step 2 is the establishment of detailed plans and specifications. In Step 3, support and supervision will be given during the implementation of the mechanical system and electronic equipment for physical protection

**Status:** Step 1 and 2 are completed. Step 3: Installation work is on-going.

**Financing:** 735 000 SEK

## LATVIA

**Co-operation partners:** Ministry of Environmental Protection and Regional Development (VARAM).

Environmental State Inspectorate (VVI).

During the early phase of the Swedish Support Programme, SKI's non-proliferation support activities in the Baltic States were to a great extent concentrated to Lithuania. Only limited legislation support had been assigned to Latvia.

As a result of a meeting in September 1997 between all three Baltic States and representatives of the support programmes of Sweden, Finland and Norway, the SKI initiated discussions with the Latvian Ministry of Environmental Protection and Regional Development and with the nuclear authority VVI. This led to an agreement in December 1997 about a support package for non-proliferation issues, including the combating of illicit trafficking. The agreement was up-dated in February 2000.

The Swedish Support Programme for Latvia comprises:

- transfer of know-how concerning the international non-proliferation regimes;
  - support for development of relevant laws and regulations with a special emphasis on future EU membership;
  - nuclear material control systems based on NPT requirements;
  - means and measures for limiting the risk for theft, sabotage or terrorist attacks against nuclear facilities and radioactive material, i.e. combating of illicit trafficking; and
  - support for establishing the new State Regulatory Authority.
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## NUCLEAR LEGISLATION

<b>Project LET 99/1</b>	<b>Legislation Development</b>
SIDA 364/99	SKI DNo. 1.632/970559

**Objective:** To review existing legislative documents and to assist in the preparation of some new draft nuclear regulation.

The Project is a direct continuation of Project LET-A.1.4 on Legislation (UD97/399/EC)

Latvia has a comprehensive nuclear legislation programme. The work to develop new laws and regulations has a dual purpose:

- to replace the old Soviet legislation with a legislative structure adapted to the Latvian tradition; and
- to bring the legislation in line with the EU requirements.

The support work on legislation is done by the ILG, who carries out reviews of some existing legislation and also gives legislative assistance in the preparation of some of the new legislation. This concerns both basic nuclear legislation and certain regulations and rules in connection with the establishment of a new State Regulatory Body.

Of particular importance is the establishment of regulations, rules and guidelines concerning the operators' fulfilment of the licensing conditions that are stipulated by the nuclear authority VVI.

The Project is carried out in co-operation with the NRPA.

The ILG has reviewed and commented upon a Draft Law on the Physical Protection of Transport of Radioactive Material. Several meetings have been held with the VARAM Director in connection with the Illicit Trafficking Combating Project (ITCP), i.e. Project LET 98/4.

In January 2000, a meeting was held in Stockholm with Latvian customs and border control authorities and VARAM to discuss an instruction and training programme and the regulation structure related thereto.

In February 2000, a workshop was held in Latvia on combating illicit trafficking measures. There were 15 participants from customs and border control authorities, police and VARAM.

**Status:** On-going.

**Financing:** SKI 511 000 SEK  
NRPA 305 000 NOK

## NUCLEAR MATERIAL CONTROL

<b>Project LET 98/2</b>	<b>State System for Nuclear Material Accountancy and Control in Latvia</b>
UD 98/1488/EC	SKI DNo. 1.633/981346

**Objective:** To install modern nuclear material control systems at the research reactor and at the State authority office.

There is one R&D Reactor (Salapils) in Latvia with highly enriched uranium fuel. The existing nuclear material control system is not meeting modern standards. The project objective is to install a new system for nuclear material accountancy and control, at the State authority office, based on the concept and computer programmes of the 3<sup>rd</sup> generation, installed both in Lithuania and Ukraine. The new systems will meet the requirements of both the IAEA and the Euratom.

The Project is carried out in co-operation with the NRPA.

**Status:** On-going. The software was installed in November 1999. After 3 months test operation, the graphics will be delivered.

**Financing:** SKI            392 000 SEK  
NRPA            250 000 NOK

## NUCLEAR MATERIAL CONTROL

<b>Project LET 99/3</b>	<b>Instruction on Non-Proliferation Matters</b>
SIDA 364/99	SKI DNo. 1.637/991307

**Objective:** To provide instruction and training on overall nuclear non-proliferation matters.

As an introduction to this project, a workshop on related laws and regulations was held under Project LET 99/1 in February 2000.

Under the Project, three seminars or workshops will be arranged for staff from ministries, authorities, customs and border control. Two of those seminars/workshops, with 20 Latvian participants each, were held in Latvia, and one more is scheduled for 2000. Furthermore, two visits to Sweden were arranged for Latvian customs and border guards' organisations that met with Swedish counter parts.

The seminar programmes address both basic non-proliferation matters and specific requirements and procedures related to the NPT, the NSG, the

Convention on Physical Protection of Nuclear Material, etc. The Project aims at establishing a national infrastructure needed for co-operation between the national authorities and for an efficient exchange of know-how and information.

**Status:** On-going.  
Instruction and training programmes are being prepared.

**Financing:** Part 1                      334 000 SEK  
Part 2 and 3                      286 000 SEK

#### COMBATING ILLICIT TRAFFICKING

<b>Project LET 98/4</b>	<b>Project Study on Combating of Illicit Trafficking</b>
UD 98/1488/EC	SKI DNo. 1.635/981358, 1.635/991040

**Objective:** To carry out a joint Swedish-Norwegian-Latvian project study on the combating of illicit trafficking of nuclear material and items.

In December 1998, VARAM, the NRPA and the SKI agreed to carry out a project study of means and measures aimed at the combating of illicit trafficking. A Working Group was established, and a Reference Group with the task to give advice to the Working Group.

The objective of the project study was outlined in the Project Directives as follows:

With focus on the Latvian and NIS situation, but with reference also to the European region, the Project study shall investigate the different means and procedures, on the national and international level, that are essential for detecting and combating Illicit Trafficking. This includes in the nuclear area: legislation, SSAC, physical protection, export/import control, radiation protection, as well as border and customs control and security police activities.

With a reference to the Scandinavian practice, the Project study shall identify actions within the various implementation areas that should be subject to improvement, and suggest how the network of involved State authorities and institutions can be developed to facilitate combating Illicit Trafficking.

Based on a survey and analysis of the current situation, the Project study shall make suggestions that would assist an assessments of what support activities, from the side of the Scandinavian countries, that could be implemented in the NIS and the Baltic States, with the purpose to improve the combating of Illicit Trafficking.



**Status:** Completed.

The result of the study was presented in SKI Report 00:003 in January 2000. The original Report is in English. Translations were made to Russian, Latvian and Estonian.

During the first part of 2000, the Report was presented at meetings in the following countries: Latvia, Estonia, Lithuania, United Kingdom, USA, Russia and Japan.

**Financing:** SKI           630 000 SEK  
NRPA           551 500 NOK  
SSI             300 000 SEK

(SSI = The National Institute of  
Radiation Protection)

## LITHUANIA

**Co-operation partner:** The Nuclear Power Safety Inspectorate (VATESI).

The first generation State system for nuclear material control was installed under the Swedish Support Programme already in 1993/94 at the VATESI Head-office in Vilnius. Instruction and training was also given to the authority staff, both in basic non-proliferation matters and specific topics related to the use and maintenance of the control system.

The SKI developed and installed a 3<sup>rd</sup> generation nuclear material control system for the new spent fuel storage at the Ignalina NPP during 1999, and a State system at VATESI in December 1999.

In 1995, the Swedish Support Programme, through the ILG, carried out a review of a Draft Nuclear Energy Law and submitted comments and advice for amendments and improvements.

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### NUCLEAR MATERIAL CONTROL

<b>Project LIT 98/1-2</b>	<b>Upgrading of the State System for Nuclear Material Control Phase 1</b>
UD 98/1488/EC	SKI DNo. 1.643/981348

**Objective:** To modify/upgrade the State system to be compatible with the facility system.

The separate, new storage for spent fuel at the Ignalina NPP was constructed by the Swedish SKB in 1998. The SKI undertook to support the plant with computer equipment and software for the nuclear material control system. The system is modern and more advanced than the control system that was installed earlier (by the SKI) at the VATESI office. It is, therefore, necessary to modify the State system, so that it will be compatible with the facility system.

The project objective is to modify the State system in a first phase, which will include the transformation from DOS to Windows.

**Status:** On-going.

**Financing:** 450 000 SEK

## NUCLEAR MATERIAL CONTROL

<b>Project LIT 99/1-1</b>	<b>Upgrading of the State System for Nuclear Material Control Phase 2</b>
SIDA 365/99	SKI DNo. 1.646/990546

**Objective:** To upgrade the State nuclear material control system to generation 3.

With the upgrading of the nuclear material control system at the Ignalina NPP that is done under the Swedish Support Programme, it is necessary also to upgrade the State system to generation 3. It would otherwise not be able to receive and process the accountancy data that are reported by Ignalina to the State authority office.

The Project will deliver and install an upgraded system (from DOS to Windows) and some new modules needed to meet the new and increased information requirements from the IAEA.

The first version of the up-dated system was delivered and installed at the VATESI office in November 1999. Specifications for the computer equipment for the Ignalina spent fuel storage have also been prepared and the supplier has been contracted (the Lithuanian company Aiva Sistema).

**Status:** On-going.  
The system is being tested. After testing, the software will be finalised and the graphic developed.

**Financing:** 596 000 SEK

## BELARUS

**Co-operation partner:** The State Committee for Supervision of Industrial and Nuclear Safety.

In co-operation with the Technical Secretariat of the Foreign Office of Japan, the SKI has designed and installed a physical protection system for the nuclear fuel storage at the nuclear research centre Sosny, near Minsk. The support includes service and maintenance during a period of three years after the system was taken into operation.

Already in 1994, the SKI submitted a proposal to a basic nuclear law to the Cabinet of Ministers. Because of the current unstable political conditions in the country, further assistance to Belarus in the area of nuclear legislation is given a law priority.

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### PHYSICAL PROTECTION

<b>Project VITR 99/1</b>	<b>Maintenance of the Physical Protection System at Sosny Nuclear Research Centre</b>
SIDA 363/99	SKI DNo. 1.684/990047

**Objective:** To provide service and maintenance of the physical protection system at Sosny, during one year.

The physical protection system of the nuclear fuel storage at Sosny was designed and installed by the SKI, in co-operation with Japan, in December 1996. The support originally included service and maintenance during a period of three years; to be agreed upon on a year by year basis. Sweden and Japan have now agreed with Sosny to extend this service for, at least, one more year.

Project VITR 99-1 covers the maintenance for the year 2000. The work is carried out during two visits to the facility and comprises necessary adjustments and corrections, as well as replacement of defect equipment.

**Status:** On-going.  
The first visit at the facility took place in May 2000.

**Financing:** SKI 385 000 SEK  
Japan 21 600 USD  
Replacement of equipment is financed separately.

## UKRAINE

**Co-operation partners:** The Nuclear Regulatory Administration (NRA) of the Ministry of Environmental Protection and Nuclear Safety (MEPNS).

The Parliament Committee for Fuel and Energy Complex, Nuclear Policy and Safety.

The State Export Control Authority of Ukraine.

The Institute of Nuclear and Energy Law (INEL) in Kiev.

Of the former Soviet republics, Ukraine is the State with the largest nuclear power programme. There are 14 reactors in operation at 5 different nuclear power plants (NPPs), and 3 major research establishments with research reactors (R&D).

SKI's support and co-operation programme with Ukrainian authorities and organisations in the area of non-proliferation started in 1992. Even if considerable progress has been made both with respect to the normative and administrative structure related to the supervision and control of nuclear activities, there are still a need for continued co-operation and support. This concerns, in particular, the further development and consolidation of the nuclear material control systems at the facilities, and the procedures and routines used for the inspections by the IAEA and the NRA inspectors.

Under the Swedish Support Programme, the nuclear material control systems have been developed and installed at 4 of the 5 nuclear power plants (i.e. at 11 reactors in operation). Limited systems have also been delivered to the R&D facilities. This has included both hardware and software, as well as training of staff and maintenance of equipment.

In co-operation with Japan, Sweden is developing and installing a complete perimeter physical protection system at the Kharkiv Institute for Physics and Technology.

In the area of nuclear legislation, the SKI supported the establishment of the Institute of Nuclear and Energy Law (INEL) in Kiev. The Institute is working for an improvement of the nuclear safety culture in Ukraine by promoting the contacts and co-operation between the different institutions and organisations in the nuclear area. The SKI is continuing its support to that activity.

## NUCLEAR LEGISLATION

<b>Project UKR 98/1-1</b>	<b>Nuclear Legislation</b>
UD 98/1488/EC	SKI DNo. 1.662/990184

**Objective:** To assist in developing laws and regulations on physical protection and export/import control.

As a continuation of the legislation support that was given in a previous project, the objective of this project is to assist the NRA in developing new laws and regulations on physical protection and export/import control. The support is given via by the ILG.

SKI experts are also working with NRA counterparts for the development of a set of authority physical protection regulations.

**Status:** On-going.

**Financing:** 689 000 SEK

## NUCLEAR LEGISLATION

<b>Project UKR 99/1-2</b>	<b>Development of the Institute of Nuclear and Energy Law in Kiev</b>
SIDA 286/99	SKI DNo. 1.662/981415

**Objective:** To support the further development of the Institute.

Through the ILG, the Swedish Support Programme has been engaged in the nuclear legislation development in Ukraine since January 1996. The co-operation partner has been the NRA, but frequent meetings have also been held with the Parliament Committee for Fuel and Energy Complex, Nuclear Policy and Safety.

The direct contacts with legislators in the Rada (the Parliament) has been used for a dialogue concerning the fundamentals of a modern legislative system in the nuclear field, based on independence, responsibility, quality control, safety culture, etc. To further promote the transformation process from the old (Soviet) legal structure into a modern, Western system, the initiative to establish the Institute of Nuclear and Energy Law was taken from the side of the Parliament Committee. The Institute was established with the support of the SKI and the ILG. The SKI continuous to support the Institute.

To support the further development and operation of the Institute, the Project will sponsor two seminars on non-proliferation matters, with participants both

from Ukraine and other NIS countries. The SKI will assist in the arrangements of the seminars and engage experts for lecturing and leaders of working groups.

The first seminar was held in Kiev during three days in December 1998 with more than 40 participants from Ukraine, Armenia, Azerbaijan, Kazakstan, Latvia and Moldova.

**Status:** On-going.  
The second seminar is scheduled for October 2000.

**Financing:** 780 000 SEK

#### NUCLEAR MATERIAL CONTROL

<b>Project UKR 98/2</b>	<b>Third Generation of the State Nuclear Material Control System</b>
UD 98/1488/EC	SKI DNo. 1.663/981347

**Objective:** To upgrade the nuclear material control system to generation 3 at the State authority office.

The computerised State nuclear material control system was developed and installed under the Swedish Support Programme in 1994, replacing the old (1<sup>st</sup> generation) system. In order to increase the performance capacity of the system, in particular with respect to the information about the total nuclear material inventories at the facilities, the system has to be further developed. The 3<sup>rd</sup> generation system will be transformed from DOS to Windows and will also be supplemented with some new modules in order to meet the new and increased information requirements from the IAEA.

The new software was delivered and installed in January 2000. It will be tested during three months, whereupon the final graphics will be submitted.

**Status:** On-going.

**Financing:** 1 204 000 SEK

## NUCLEAR MATERIAL CONTROL

<b>Project UKR 99/3</b>	<b>Third Generation Nuclear Material Control Systems at four Nuclear Power Plants</b>
SIDA 286/99	SKI DNo. 1.663/000222

**Objective:** To upgrade the nuclear material control systems to generation 3 at four NPPs.

The 2<sup>nd</sup> generation computerised nuclear material control systems at four nuclear power plants (Chernobyl, Khmel'nitsky, Zaporozhye and South Ukraine) were developed and installed under the Swedish Support Programme. They are now more than four years old and need to be modernised. The 3<sup>rd</sup> generation systems will be transformed from DOS to Windows and will also be supplemented with some new modules in order to meet the new and increased information requirements from the IAEA. Some of the changes are necessary for making the inspection activities by the NRA and the IAEA inspectors more efficient. The new systems will also be able to handle burn-up and Plutonium production calculations, as well as fuel assembly position mappings of both reactor cores and storage ponds.

The Project will comprise up-dated and new software, new hardware and training of staff.

**Status:** On-going.

**Financing:** 1 761 000 SEK

## NUCLEAR MATERIAL CONTROL

<b>Project UKR 99/4</b>	<b>Instruction and Training in Inspection Technique</b>
SIDA 286/99	SKI DNo. 1.667/991080

**Objective:** To instruct and train facility staff and NRA inspectors in inspection technique.

In 1997, the SKI carried out a quality revision of the different activities and procedures at the facilities and the NRA office that, up till then, had been subject to the Support Programme projects. It was then found, that there was uncertainty among both facility and authority personnel in a series of matters related to the safeguards inspections by the IAEA inspectors. This concerned the scope of the inspections, the rights and obligations of the parties of the safeguards agreements, insufficient knowledge about measurement equipment and procedures, incomplete instructions, etc.



The problem was discussed at a seminar, arranged by the SKI in March 1998, with personnel in leading positions from ministries, authority and nuclear power plants. As a result, the NRA decided to use their inspectors stationed at the facilities also for the non-proliferation control. This has led to an increased need for instruction and training of that staff.

It has been agreed that the instruction and training of the NRA staff should be made jointly with the facility personnel at all five nuclear power plants. Since one of the plants (Rovno) has developed its nuclear material control system with the support from Finland, the Finnish Centre for Radiation and Nuclear Safety (STUK) has been invited to contribute to this project activity.

The Project will comprise three training courses: two for the four plants that have VVER type reactors, and one specifically directed to the resident State inspectors.

The project is carried out in co-operation with the STUK.

During the period 17-22 February 2000, two training courses were held at South Ukraine NPP and Rovno NPP respectively. Staff from the other three NPPs participated, as well as staff from NRA and the Main State Inspectorate. The IAEA participated with an instructor.

**Status:** On-going.

**Financing:** SKI 759 000 SEK  
STUK 100 000 FMK (Finnish Mark)

#### PHYSICAL PROTECTION

<b>Project UKR 99/5</b>	<b>Physical Protection at Kharkiv Institute for Physics and Technology (KIPT)</b>
SIDA 286/99	SKI DNo. 1.664/980873; 1.664/000483

**Objective:** To supplement the physical protection system at KIPT.

This project is a direct continuation of project UKR-C.2.2 (UD97/402/EC)

The physical protection at KIPT is being developed and installed with support from the USA, Japan and Sweden. The site protection part is done jointly by the SKI and the Technical Secretariat of the Japanese Foreign Office. The SKI is directly responsible for the concept and design of the site protection, including project management, procurement, installation and testing. Japan is financing the equipment.

**Status:** On-going.  
The installation is scheduled to be completed during the third quarter of 2000. Thereafter three months test operation. Final delivery of the system is scheduled for the end of 2000.

**Financing:** SKI 771 000 SEK  
Japan 21 215 300 SEK

#### COMBATING ILLICIT TRAFFICKING

<b>Project UKR 99/6</b>	<b>Combating Illicit Trafficking</b>
SIDA 286/99	SKI DNo. 1.665/991041

**Objective:** To prevent illicit trafficking through improved knowledge about export control and physical protection at the nuclear facilities.

With earlier projects under the Swedish Support Programme, assistance has been given to the NRA for the development of a State concept for physical protection. In addition, the ILG has advised on the drafting of laws on physical protection and export/import control.

The NRA is, however, facing the problem of getting consensus among concerned ministries and authorities for a common concept and policy for the combating of illicit trafficking and, in particular, the need for adequate physical protection at the nuclear facilities and for an effective export/import control. It is, therefore, a need for transferring knowledge on the different aspects of combating illicit trafficking to people in leading positions.

Following discussions between the SKI and both the nuclear and the export control authorities, the SKI undertook to arrange one seminar and three workshops for concerned staff on different management levels from these authorities and from the Parliament and concerned ministries.

**Status:** On-going.  
The seminar was held in Stockholm in November 1999, in co-operation with the National Inspectorate of Strategic Products (ISP), with participants from the State Export Control Authority of Ukraine.

**Financing:** 748 000 SEK

## AZERBAIJAN

**Co-operation partner:** The Office of the Cabinet of Ministers, in Baku.

Of the three former Soviet republics in the Caucasus region (Armenia, Georgia and Azerbaijan), only Armenia has a nuclear power plant (Medzamor NPP). Georgia has two research centres with nuclear capacities and a big number of nuclear scientists. In Azerbaijan, the nuclear structure is limited to radiation sources, used mainly in the oil industry and medicine, but there are also big quantities of nuclear waste.

Because of their geographical location, all three States are typical transit countries. Azerbaijan has borders both with Russia and Iran. These circumstances, in combination with the unstable political conditions in the whole region, bring these countries into particular focus of the world community with respect to the potential for illicit trafficking of nuclear material and items.

During 1996 and 1997, the Swedish Support Programme, through the ILG, assisted Georgia and Armenia in the introduction of new nuclear legislation. In both States, the ILG advised on the development of basic nuclear laws, which were, in a series of draft review and comments, prepared for the Parliaments.

With a reference to that support from Sweden, Azerbaijan has asked for a similar assistance, claiming that both knowledge and equipment is urgently needed for combating illicit trafficking. A first visit to Baku, by the ILG Chairman and Technical Secretary, took place in September 1999, with the purpose to discuss a co-operation programme with concerned ministries and institutions.

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### COMBATING ILLICIT TRAFFICKING

<b>Project AZER 99/1</b>	<b>Combating Illicit Trafficking: Legislation</b>
SIDA 368/99	SKI DNo. 1.612/991021

**Objective:** To support the establishment of a State system for the combating of illicit trafficking through the development of relevant nuclear legislation.

The Project covers the first step towards the establishment of a State system for the combating of illicit trafficking, in the form of assistance and advice by the

ILG, for the development of basic nuclear legislation and regulation. At a visit to Baku in September 1999, meetings were held with all concerned ministries and supervision and law enforcement authorities. A proposal for a basic (concept) nuclear law was submitted.

At a meeting in the Ministry of Justice, the Azerbaijanian side expressed strong interest in co-operation in the field of nuclear legislation.

**Status:** On-going.  
A second meeting is planned.

**Financing:** 557 000 SEK

## KAZAKSTAN

**Co-operation partners:** The Atomic Energy Committee (KAEA).

The Ministry of Energy (previously Science and New Technologies).

The SKI has given support and assistance to the KAEA since 1992, in particular in the areas of nuclear legislation and nuclear material accountancy and control. A proposal to a basic nuclear law was submitted in 1994. The ILG assisted in the drafting of laws on physical protection, radiation safety, export/import control and radioactive waste management. ILG's Model State Concept for Physical Protection was in its essential parts applied in the first law on physical protection.

The Swedish Support Programme has also developed and installed computer programmes for the nuclear material control systems, both at the KAEA office and at the nuclear fuel fabrication plant Ulba in Ust-Kamenogorsk and the research reactors at Almaty and Semipalatinsk. This has included hardware and software, as well as instruction and training of staff and service and maintenance for a period of three years.

A major part of the Swedish Support Programme activities have been focused on the Ulba facility, which is a supplier of nuclear fuel to Russian nuclear power plants. The support comprises nuclear material accountancy and control system, including measurement and physical inventory procedures.

Of particular interest and importance is the SKI support to the Ministry of Science and New Technologies for the establishment of an institute for law and non-proliferation research.

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### NUCLEAR MATERIAL CONTROL

<b>Project KAZ 99/1</b>	<b>Continued Support to Ulba for the Development of the Internal Control System</b>
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SIDA 367/99	SKI DNo. 1.623/971629
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**Objective:** To assist and advice Ulba in the project management of the new system for internal control of nuclear material accountancy.

This project is a direct continuation of Project KAZ-B.1.4 (UD97/403/EC).

The SKI has delivered parts of the internal control system for the nuclear fuel fabrication plant at Ulba, and has, together with the EU Joint Research Centre ISPRA, carried out a pilot study of needed equipment, i.e. for measurement of uranium solutions, calibration of scales, and the use of seals. As a result of the study, the SKI and ISPRA jointly formulated a proposal to a TACIS project for covering the financing of the needed equipment.

ULBA has also applied for financial contribution from the International Science and Technology Centre (ISTC) in Moscow, for the development of the internal control system, and has asked for assistance from the SKI to carry out the project. The objective is to establish an integrated internal control system for the entire fuel fabrication plant. The SKI is contributing with project management advice, based on the specific expertise know-how and experience available from the Swedish Support Programme group of consultants.

**Status:** On-going.  
The TACIS project has been approved. ISPRA is preparing a contract with ULBA, a Belgian company and the SKI.

**Financing:** 370 000 SEK plus 90 000 EURO as sub-contractor to TACIS.

#### NUCLEAR MATERIAL CONTROL

<b>Project KAZ 99/2</b>	<b>Nuclear Material Control: Temporary Solution of the Turn of the Millennium Problem (Y2K)</b>
SIDA 367/99	SKI DNo. 1.623/990301

**Objective:** To install “temporary fixes” at the computerised control systems at three facilities.

The computer programmes for the nuclear material control systems at all nuclear facilities in Kazakhstan were developed and installed by the SKI in 1993/94. With the exception of Ulba, no up grading of the systems has been made (from DOS to Windows). Because of IAEA’s requirement specifications for reporting, the software could not be secured on time for the turn of the millennium problem (Y2K).

Under the support project, certain “fixes” to manage the problem are made by Swedish computer experts, as a temporary solution, at Almaty, Semipalatinsk and Akatu.

**Status:** On-going. A contract has been concluded with the KAEA about the equipment. Procurement is under way.

**Financing:** 240 000 SEK

## COMBATING ILLICIT TRAFFICKING

<b>Project KAZ 98/ L</b>	<b>Establishment of Institute for Nuclear Non-Proliferation Research and Promotion - Phase 1</b>
UD 98/1488/EC	SKI DNo. 1.627/000131

**Objective:** To give support and advice for the establishment of a nuclear non-proliferation institute in Kazakstan.

In 1995, the SKI initiated discussions with the Ministries for Foreign Affairs, and of Science and New Technologies about the establishment of an institute for research and promotion of non-proliferation of weapons of mass destruction, in particular nuclear weapons. Because of its strategic geographical location and relations with key-states in the region, as well as its experience from nuclear weapons tests during the Soviet era, Kazakstan was considered as a suitable residence of such an institute.

Following a positive response from the side of Kazakstan, the SKI prepared a detailed proposal and plan for the establishment of an institute. The proposal emphasised the positive impact that the institute would have on the motivation to live up to the NPT commitments, both by Kazakstan and the other States in the region. The proposal also established some fundamental criteria for the institute's statute, namely, that the institute should be:

- financed by the Kazakstan Government;
- politically independent; and
- operated under consideration of modern right of participation in decision-making and equality.

It was assumed, that the institute should be operated with a modest size in the initial phase, and that experience and interest from other States in the region should be decisive for future expansion.

The work to establish the institute is in progress, with support from Sweden and the USA. The Swedish support project comprises the following items:

- 4.a transfer of knowledge and experience from establishment, operation and maintenance from similar institutes in Sweden (SIPRI) and Europe;
- 4.b support for developing the normative basis for the establishment of the institute;
- 4.c support for the identification of logistic requirements and conditions, necessary for the promotion of constructive research, including library and information functions, international databases, and contact with other institutes;
- 4.d support for the physical establishment of the institute and its taking into operation;
- 4.e promotion of an active exchange of scientists with other countries, including Sweden.

Phase 1 of Project KAZ 99/3 covers item 4.b and 4.c.

**Status:** On-going. See further under Project KAZ 99/3 below.

**Financing:** 558 000 SEK

#### COMBATING ILLICIT TRAFFICKING

<b>Project KAZ 99/3</b>	<b>Establishment of Institute for Nuclear Non-Proliferation Research and Promotion - Phase 2</b>
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SIDA 367/99	SKI DNo. 1.627/980388
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**Objective:** To continue the support of the Institute.

Phase 2 of the Project covers item 4.a, as described under Project KAZ 98/ L above.

As agreed between the SKI and the Institute, a joint seminar was arranged in March 2000 in Almaty with the purpose to discuss and establish a common action plan for the combating of illicit trafficking in the Central Asian and the Caucasus regions. Participants were from Kazakstan, Uzbekistan, Kyrgyzstan, Tajikistan, Georgia and Azerbaijan. The seminar participants agreed on an action plan that is essentially based on the recommendations given in the ITCP Report (SKI 00:03).

A small working group was established with members from Kazakstan and the SKI. Based upon the ITCP Report, the Group will prepare a paper, outlining the needs for a national system for combating illicit trafficking. The paper will be distributed to participating countries that will clarify the needs in each country individually.

A co-ordination of the plans will be done at a second seminar in Kazakstan scheduled for the end of 2000.

**Status:** On-going.

**Financing:** 452 000 SEK



## POLAND

**Co-operation partner:** The National Atomic Energy Agency of Poland (NAEA).

The IAEA arranged a symposium in Vienna in February 1999 with the purpose to clarify the "turn of millennium" (Y2K) problem, which is affecting the member States' nuclear material control systems. Several of the Central and Eastern European countries asked for assistance to solve the problem; among them Poland.

Under the Swedish Support Programme, the SKI has been including the necessary measures to handle the millennium problem for all nuclear material control systems developed and installed in, among others, Latvia, Lithuania, Ukraine and Kazakstan. In response to an inquiry from the IAEA, the SKI undertook to give the needed support to Poland, using the know-how and experience from the support work in other countries.

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### NUCLEAR MATERIAL CONTROL

<b>Project POL 99/1</b>	<b>Upgrading of Material Control System to meet the Turn of Millennium Problem (Y2K)</b>
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SIDA 309/99	SKI DNo. 1.671/991309, 1.673/991334
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**Objective:** To ensure that the Polish State system for nuclear material control will be able to fulfil its tasks of recording and reporting to the IAEA also after 1 January 2000.

The project has two phases:

**Phase 1:** to analyse the possibilities to convert the current software in DBASE 3 to Clipper and to make the necessary modifications to solve the millennium problem temporarily;

**Phase 2:** to replace the old system with a new, modern control system of the same type and quality installed by the SKI in other recipient countries under the Swedish Support programme.

**Status:** On-going.  
Phase 1 is completed.

**Financing:** 321 000 SEK, for Phase 1.

<p><b>COMMON PROJECTS ON NUCLEAR LEGISLATION</b></p>
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Support activities which concerns more than one recipient country are reported in, so called, common projects. So far, common projects have been established only in the area of nuclear legislation, mainly with the engagement of the International Group of Legal Experts (ILG).

The ILG has established co-operation arrangements with 10 States, namely Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Ukraine and Russia.

**NUCLEAR LEGISLATION**

<b>Project GEM 98/1</b>	<b>Scandinavian Seminar on Nuclear Non-Proliferation</b>
UD 98/1488/EC	SKI DNo. 1.612/990414

**Objective:** To arrange a seminar with participants from Support Programme recipient countries on combating illicit trafficking.

A seminar, jointly sponsored by the SKI and the NRPA, was held on 1 to 3 June 1999 at Randsvangen in Norway. It was organised to respond to the needs of representatives of governments, parliaments and senior officials in ministries and other governmental agencies whose responsibilities include nuclear non-proliferation issues. The seminar topic was:

Nuclear Non-Proliferation in a political context, with emphasis on experience and problems related to the development and implementation of international instruments for non-proliferation, including the NPT; Safeguards Agreements with the IAEA including the Additional Protocol; export/import control; physical protection; illicit trafficking and terrorism; and the Convention on Physical Protection of Nuclear Material.

The participants came from: Armenia, Azerbaijan, Georgia, Kazakstan, Latvia, Moldova, Ukraine and Russia.

**Status:** Completed.

**Financing:** SKI            574 000 SEK  
                   NRPA            368 000 SEK

## NUCLEAR LEGISLATION

<b>Project GEM 99-1</b>	<b>Nuclear Legislation: Technical Secretariat for the International Group of Legal Experts (ILG)</b>
SIDA 362/99	SKI DNo. 1.605/990992

**Objective:** To assist the ILG Chairman and the group members with secretarial support.

The ILG was established in 1994. To serve the chairman and the members (from Australia, Norway, Finland and Sweden) with secretarial support and activities, a Technical Secretary has been assigned.

The ILG has established co-operation programmes in the field of nuclear legislation, or agreed on working relations, with Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Ukraine and Russia.

**Status:** On-going.

**Financing:** 626 000 SEK

## **E.2 Projects Completed before 1999 (during 1991-1998)**

<b>RUSSIA</b>
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### **Project RYS I.1 Seminar on Nuclear Legislation**

(UD 97/398/EC/ SKI DNo. 1.652/971650)

A three day seminar on nuclear legislation was organised by the SKI in Moscow 1998.

Financing: 192 000 SEK

### **Project RYS II.1 Nuclear Material Control System at the Murmansk Shipping Company**

(UD 97/398/EC/ SKI DNo. 1.653/961612)

A modern nuclear material control system was delivered and installed at the Murmansk Shipping Company in February 1998.

Financing: SKI 587 000 SEK  
NRPA 382 000 SEK

### **Project RYS II.2 Physical Protection of Nuclear Fuel at Murmansk Shipping Company**

(Government decision 14 (U11) / SKI DNo. 1.654/961427)

The project concerns the nuclear icebreakers operated by the Murmansk Shipping Company in Murmansk. A pilot study has been done, on basis of which a design of the physical protection system was developed. After approval in principle by GAN, a Murmansk Company was contracted to further detail the design. The project will continue after a Russian installation company has been selected. (Continues by project RYS 98/7 SKI Dno. 1.654/990189)

Financing: SKI 592 000 SEK  
NRPA: 289 100 SEK

### **Project RYS III.1 Material Control System for facilities**

(UD 97/398/EC/ SKI DNo. 1.653/981332, 1.656/990093)

A software demonstration package of a modern nuclear material control system was developed and demonstration has been done for GAN in St.Petersburg.

Financing: 497 000 SEK

### **Project RYS III.2 Equipment for GAN's Office in the North West Region in St Petersburg**

(UD 97/398/EC/ SKI DNo. 1.656/970200; 1.656/971442)

Office equipment and physical protection measures were installed at the GAN NED office at the end of 1997, in co-operation with the NRPA.

Financing: SKI 185 000 SEK  
NRPA: 1 301 000 SEK

**Project RYS IV.1 Concept for Physical Protection**

(UD 97/398/EC/ SKI DNo. 1.654/971447)

A concept for physical protection of Russian nuclear facilities was worked out by the SKI in co-operation with GAN NED staff, and was presented in the summer of 1998.

Financing: 246 000 SEK

**Project RYS IV.3 Regulations on Physical Protection**

(UD 97/398/EC/ SKI DNo. 1.655/980208)

As a continuation of Project RYS IV.1, draft regulations on physical protection were prepared by the SKI in co-operation with GAN staff, and were presented in 1998.

Financing: 238 000 SEK

**Project RYS V.1 Export Control Routes**

(UD 97/398/EC/ SKI DNo. 1.656/980676)

A study on export routes and export control routines in the north-west region was done and presented by the SKI in 1998.

Financing: 193 000 SEK

**Project RYS V.2 Seminar on Export/Import Control**

(UD 97/398/EC/ SKI DNo. 1.651/940932)

A seminar on export control was organised jointly by the SKI and the NRPA in June 1996 in Svanhøvd in Norway.

Financing: 111 000 SEK

**Project RYS B.6.1 Standardised Nuclear Material Control**

(UD 97/398/EC/ SKI DNo. 1.653/961232)

A proposal for standardisation of the nuclear material control system in Russia was worked out by the SKI and was presented to GAN in 1998.

Financing: 543 000 SEK

**Project RYS D.3.1 Export/Import Control**

(UD 97/398/EC/ SKI DNo. 1.655/980209)

The SKI, in co-operation with the NRPA, made a study of export/import control routines in the north-west region for radioactive material, equipment and technology and suggested improvements of the current system. The study was presented in 1998.

Financing: SKI 642 000 SEK  
NRPA 226 000 SEK

LATVIA
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**Project LET-1      Nuclear Legislation and Regulations**

(SKI DNo. 1.632/950935)

Initial legislation assistance by the ILG covering the period June 1995 to end of 1996.

**Project LET-2      Proposal for Physical Protection System at the  
Research Facility Salaspils**

(SKI DNo. 1.634/950936)

Investigation study of technical and administrative conditions and a proposal for a physical protection system at Salaspils during 1995.

Financing for Projects LET-1, LET-2:    158 000 SEK

**Project LET-A.1.4   Continued Nuclear Legislation Assistance**

(UD 97/399/EC/ SKI DNo. 1.632/970559)

Nuclear legislation work by the ILG during 1997.

Financing:    115 000 SEK

**Project LET-C.4.1   Physical Protection at Facilities**

(UD 97/399/EC/ SKI DNo. 1.634/990811)

A concept study on physical protection at Salaspils and the waste storage facility "Radon".

Financing:    234 000 SEK

**Project LET-D.2.1   Export/Import Control**

(UD 97/399/EC/ SKI DNo. 1.635/971317)

In co-operation with the NRPA, a study of export/import conditions and a proposal for measures against illicit trafficking.

Financing:    260 000 SEK

<b>LITHUANIA</b>
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**Project LIT-1      Proposal for Basic Nuclear Law and Regulations**

(SKI DNo. 1.4/940291; 1.642/940954)

A proposal for a basic nuclear law was submitted by the ILG in October 1995.

**Project LIT-2      State Nuclear Material Control System**

(SKI DNo. 1.4/931137; 1.641/940950)

A preliminary study of a State system for nuclear material control was made during 1994 and a report was submitted to VATESI in December of that year.

**Project LIT-3      Computer Programmes for the Authority**

(SKI DNo. 1.643/940951)

Computer programmes for the State material control system was developed and installed at the VATESI office in December 1995.

**Project LIT-4      Physical Protection Improvements at the Ignalina NPP**

(SKI DNo. 1.4/940290)

Expert assistance for the improvement of the physical protection system, during the whole of 1995.

Financing for projects LIT-1 – LIT-4:      1 010 000 SEK

**Project LIT-A1.3      Continued Nuclear Legislation Assistance**

(UD 97/400/EC/ SKI DNo. 1.642/970855)

Nuclear legislation work by the ILG during 1997.

Financing:      179 000 SEK

**Project LIT-B.3.1      Nuclear Material Control**

(UD 97/400/EC/ SKI DNo. 1.643/961285; 1.643/970498)

Preliminary study of the material control system for the new, separate spent fuel storage. This project is continued by Project LIT 99/1-1.

Financing:      593 000 SEK

<b>BELARUS</b>
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**Project VITR-1      Proposal for Basic Nuclear Law**

(SKI DNo. 1.4/940293)

The SKI presented a proposal for a basic nuclear law in May 1994.

**Project VITR-2      Proposals for Nuclear Regulations**

(SKI DNo. 1.682/940960)

The ILG prepared proposals for nuclear regulations on non-proliferation matters, including physical protection, export/import control and transport of nuclear material. A seminar for people in leading positions from authorities and facilities was organised. The Project covers the period 1995 and 1996.

**Project VITR-3      Specification for an SSAC**

(SKI DNo.1.4/940099, 1.682/940956)

A specification for a State nuclear material control system was prepared by the SKI and proposals for recording and reporting routines were presented at the end of 1995.

**Project VITR-4      Proposal for Physical Protection System at Sosny**

(SKI DNo. 1.4/940292, 1.674/940961)

A study of the physical protection system at Sosny was made jointly by Sweden, Japan and the USA. A proposal for an improved physical protection system was submitted in December 1994.

Financing for Projects VITR-1 – VITR-4:                      4 235 000 SEK

**Project VITR-5 and VITR-C.3.1      Installation of a Physical Protection System at Sosny**

(UD 97/401/EC/ SKI DNo. 1.684/970272, 1.684/970557, 1.684/980553)

A joint Swedish-Japanese project for the installation of a physical protection system at Sosny was started in April 1995. It was completed in December 1996. This project is continued by Project VITR 99/1.

Financing:    SKI                      460 000 SEK  
                    Japan                      1 246 700 SEK

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**Project VITR-A.1.5      Continued Nuclear Legislation Assistance**

(UD 97/401/EC/ SKI DNo. 1.682/970856)

Nuclear legislation work by the ILG during 1995 and 1996.

Financing:    195 000 SEK



<b>UKRAINE</b>
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**Project UKR-1      Proposals for Basic Nuclear Law and Regulations**

(SKI DNo. 1.4/940590; 1.662/950911; 1.662/961289)

Initial legislation assistance by the ILG covering the period April 1995 to end of 1996.

**Project UKR-2      Material Control at Zaporozhye NPP**

(SKI DNo. 1.4/931128)

Analysis of material flows and fuel inventories; report submitted in January 1994.

**Project UKR-3      Routines for Material Recording and Reporting**

(SKI DNo. 1.4/921432; 1.4/931124)

Proposal for a material control system for State authority and facilities; report presented to NRA in June 1994.

**Project UKR-4      State Level Module Material Control System**

(SKI DNo. 1.4/921432; 1.4/931123)

Computer programme developed and installed at the NRA office in October 1994.

**Project UKR-5      General Ledger Handling Module and Physical Inventory Listing Module for Facilities**

(SKI DNo. 1.4/931124; 1.663/950908)

Computer programmes developed and installed at 3 NPPs (Chernobyl, Zaporozhye, Khmel'nitsky) in October 1994.

**Project UKR-6      Integrated Material Control System for Khmel'nitsky NPP**

(SKI DNo. 1.663/940939; 1.663/950908)

Development and installation of computer programme for an inventory handling module during 1995.

**Project UKR-7      Instruction and Training in Computerised Material Control System**

(SKI DNo. 1.4/931136)

A course on basic computerised nuclear material control system was held by the SKI at Ispra in Italy in January 1994 for participants from Ukraine and Kazakstan.

**Project UKR-8      Instruction and Training in Using the Computer Programmes**

A one week training course for staff from the NRA and Chernobyl, Zaporozhye and Khmel'nitsky NPPs in November 1993 in Kiev.

**Project UKR-9      Intensive Course on Computer Programmes for Authority Staff**

(SKI DNo. 1.4/941013; 1.4/940756)

A one week training course for NRA staff in June 1994 in Stockholm.

**Project UKR-10    Intensive Course on Computer Programmes for Facility Staff**

(SKI DNo. 1.4/941013; 1.4/940756)

A one week training course for staff from Chernobyl, Zaporozhye and Khmel'nitsky NPPs in June 1994 in Stockholm.

**Project UKR-11    Programme for Determining Uranium and Plutonium in Spent Fuel**

(SKI DNo. 1.4/931128)

Development of a calculation method for the reactor types VVER 1000 and RMBK; report was submitted to the NRA in September 1994.

**Project UKR-12    Computer Equipment for the Authority**

(SKI DNo. 1.4/931125)

Computers and printers were delivered by the SKI to the NRA in October 1994.

**Project UKR-13    Computer Equipment for Facilities**

(SKI DNo. 1.4/931125)

Computers and printers were delivered by the SKI to Chernobyl, Zaporozhye and Khmel'nitsky NPPs in October 1994.

**Project UKR-14    Training of Authority and Facility Staff in the Use of Personal Computers**

A training course in the use, service and maintenance of computer equipment was held by the SKI in November 1993 in Kiev.

**Project UKR-15 Training of Authority and Facility Staff on Computer Hardware**

(SKI DNo. 1.4/940768)

A training course in the use, service and maintenance of computer equipment was held by the SKI in June 1994 in Gothenburg.

**Project UKR-16 Office Equipment for the Authority**

(SKI DNo. 1.4/931125)

Equipment was installed at the NRA office in October 1994.

**Project UKR-17 CD and TV Equipment for the Authority**

Equipment was installed at the NRA office in October 1992.

Financing for Projects UKR-1 – UKR-17: 6 007 000 SEK

**Project UKR-A.1.2 Continued Nuclear Legislation Assistance**

(UD 97/402/EC/ SKI DNo. 1.662/970339)

Nuclear legislation work by the ILG during 1997. This project is continued by Project UKR 98/1-1.

Financing: 268 000 SEK

**Project UKR-B.2.1 Nuclear Material Control Review and Analysis**

(UD 97/402/EC/ SKI DNo. 1.663/961295)

A review and analysis of the installed computerised material control systems at the NRA and four NPPS (Chernobyl, Zaporozhye, Khmel'nitsky and South Ukraine) was carried out by the SKI and reported to the Authority in January 1997.

Financing: 323 000 SEK

**Project UKR-B.2.2 Seminar on Non-Proliferation Policy**

(UD 97/402/EC/ SKI DNo. 1.667/971348; 1.667/980084 )

A seminar for upper management from ministries, authorities and NPPs was held in March 1998 in Kiev.

Financing: 277 000 SEK

**Project UKR-B.2.3 Inventory Handling System for Zaporozhye NPP**

(UD 97/402/EC/ SKI DNo. 1.663/961292: 1.663/980537 )

The computerised internal system was developed by the SKI and installed in 1997.

Financing: 717 000 SEK

#### **Project UKR-B.2.4 Up-grading of Material Control Systems**

(UD 97/402/EC/ SKI DNo. 1.663/961291)

The up-grading of the material control systems to 3<sup>rd</sup> generation at the Authority and four NPPs (Chernobyl, Zaporozhye, Khmelnytsky and South Ukraine) was initiated with this project and continued with Project UKR 98/2 and Project UKR 99/3.

Financing: 157 000 SEK

#### **Project UKR-B.2.5 Instruction of Authority and Facility Staff on Nuclear Material**

(UD 97/402/EC/ SKI DNo. 1.666/971526)

A workshop for middle management was held in March 1998 in Kiev.

Financing: 438 000 SEK

#### **Project UKR-C.2.1 Concept for Physical Protection**

(UD 97/402/EC/ SKI DNo. 1.664/971359)

A concept for physical protection was worked out during a series of meetings in Kiev, Vienna and Stockholm during the first half of 1998. A workshop was also organised by the SKI in Stockholm in March 1998.

Financing: 276 000 SEK

#### **Project UKR-C.2.2 Physical Protection at Kharkiv Research Centre (KIPT)**

(UD 97/402/EC/ SKI DNo. 1.664/970273; 1.664/980873)

An agreement on co-operation was made in January 1997 between Sweden, Japan and the USA to improve the physical protection system at KIPT. The USA undertook to improve the protection of the storage building for strategic nuclear material, while Sweden and Japan jointly undertook to develop and install a new perimeter protection. A proposal for perimeter protection was submitted at the end of 1997. This project is continued by Project UKR 99/5.

Financing: SKI 564 000 SEK

<b>KAZAKSTAN</b>
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**Project KAZ-1      Proposal for Basic Nuclear Law**

(SKI DNo. 1.622/950917)

The SKI presented a proposal for a basic nuclear law in November 1994.

**Project KAZ-2      Proposals for Nuclear Regulations**

(SKI DNo. 1.622/961232)

The ILG prepared proposals for nuclear regulations on non-proliferation matters, including physical protection, export/import control and transport of nuclear material. A seminar for people in leading positions from authorities and facilities was organised. The Project covers the period 1994 through 1996.

**Project KAZ-3      Analysis of Material Flows and Inventories**

Analysis of material flows and fuel inventories at the Ulba fuel fabrication plant and the BN-350 fast breeder reactor plant. Report presented in February 1994.

**Project KAZ-4      Routines for Material Recording and Reporting**

(SKI DNo. 1.621/940944)

Analysis of routines for material control and a proposal for a material control system. Report presented in May 1994.

**Project KAZ-5      State Level Module Material Control System**

(SKI DNo. 1.623/940945)

Computer programme developed and installed at the KAEA office in September 1994.

**Project KAZ-6      General Ledger Handling Module and Physical  
Inventory Listing Module for Facilities**

(SKI DNo. 1.4/940945)

Computer programmes developed and installed at Ulba, BN-350 and the nuclear research centres at Semipalatinsk and Almaty in September 1994.

**Project KAZ-7      Inventory Handling Module for the Ulba Fuel  
Fabrication Plant**

Development and installation of computer programme for an inventory handling module at the end of 1995.

**Project KAZ-8      Inventory Handling Modules at Semipalatinsk and Almaty**

Development and installation of computer programmes for inventory handling modules in January 1995.

**Project KAZ-9      Instruction and Training in Computerised Material Control System**

(SKI DNo. 1.4/931136)

A course on basic computerised nuclear material control system was held by the SKI at Ispra in Italy in January 1994 for participants from Ukraine and Kazakstan. See also Project UKR-7.

**Project KAZ-10      Instruction and Training in Using the Computer Programmes**

A one week training course for staff from the KAEA and Ulba, BN-350 Semipalatinsk and Almaty in September 1993 in Almaty.

**Project KAZ-11      Intensive Course on Computer Programmes for Authority Staff**

A one week training course for KAEA staff in October 1994 in Stockholm.

**Project KAZ-12      Intensive Course on Computer Programmes for Facility Staff**

A one week training course for staff from the facilities in November 1994 in Stockholm.

**Project KAZ-13      Assistance at the First Physical Inventory Taking at Ulba**

(SKI DNo. 1.623/950914)

Assistance to prepare a preliminary plan for the first physical inventory taking was given at meetings in Stockholm and at the Swedish nuclear fuel fabrication plant at the beginning of 1995.

**Project KAZ-14      Computer Equipment and Computer Network for the Authority**

(SKI DNo. 1.4/940946)

Computers, networks and printers were delivered by the SKI and installed at the KAEA office in December 1993.

**Project KAZ-15      Computer Equipment for Facilities**

(SKI DNo. 1.4/931131)

Computers and printers were delivered by the SKI to Ulba, BN-350 Semipalatinsk and Almaty in December 1993.

**Project KAZ-16 Training of Authority and Facility Staff on Computer Hardware**

(SKI DNo. 1.4/940946)

A training course in the use, service and maintenance of computer equipment was held by the SKI in July 1994 in Almaty.

**Project KAZ-17 Office Equipment for the Authority**

Equipment was installed at the KAEA office in December 1993.

Financing Projects KAZ-1 – KAZ-18: 6 145 000 SEK

**Project KAZ-A.1.1 Continued Nuclear Legislation Assistance**

(UD 97/403/EC/ SKI DNo. 1.622/970558)

Nuclear legislation work by the ILG during 1997.

Financing: 271 000 SEK

**Project KAZ-B.1.1 Maintenance of Computer Programmes**

(UD 97/403/EC/ SKI DNo. 1.623/961275)

Maintenance and up-dating of computer programmes at the Authority and the facilities, during 1997.

Financing: 142 000 SEK

**Project KAZ-B.1.4 Pilot Study of Material Control System for Ulba**

(UD 97/403/EC/ SKI DNo. 1.623/961534; 1.623/971629)

The SKI, in co-operation with EU-JRC Ispra, made a pilot study of the internal control system at Ulba during 1997. This project is continued by Project KAZ-99/1.

Financing: 664 000 SEK

**Project KAZ-B.1.5 Quality Assurance Review**

(UD 97/403/EC/ SKI DNo. 1.627/980085)

A Quality Assurance group with Swedish and German experts made a revision of nuclear material control systems and physical protection at the KAEA, Ulba and Almaty in February 1998.

Financing: 335 000 SEK

## COMMON PROJECTS

### **Project GEM-1    Instruction and Training on SSAC**

Several basic courses on nuclear material accountancy and control with participants from Ukraine and Kazakstan during 1992 and 1993 in Stockholm.

### **Project GEM-2    Safeguards Seminars for Facility Management**

Several seminars on safeguards matters with management staff from nuclear facilities in Ukraine and Kazakstan during 1992 and 1993 in Stockholm.

### **Project GEM-3    Introduction Courses on Safeguards Agreements**

Several seminars and meetings with authority staff on safeguards and inspection matters during 1992 and 1993 in Stockholm, Almaty and Kiev.

Financing Projects GEM-1 – GEM-3:    1 862 000 SEK

### **Project GEM-A.2    Nuclear Legislation: Technical Secretariat for the International Group of Legal Experts (ILG)**

(UD 97/407/EC/ SKI DNo. 1.601/970608; 1.605/971396; 1.605/980497 )

The Project covers the period up to and including 1998.

Financing:    495 000 SEK