

Safeguards

Objective

To provide the international community, in the most effective and efficient manner, with credible assurance that States are complying with their safeguards commitments.

The Safeguards Statement for 2003

The Secretariat's findings and conclusions for 2003 are based upon an evaluation of all the information available to the Agency in exercising its rights and fulfilling its safeguards obligations for that year.

Safeguards activities were implemented for 40 States¹ with both comprehensive safeguards agreements in force and additional protocols in force or being otherwise applied. Only for such States are Agency safeguards able to provide credible assurance not only regarding the non-diversion of nuclear material but also regarding the absence of undeclared nuclear material and activities.

- For 19 of those States, the Secretariat completed sufficient activities and evaluation and found no indication of the diversion of nuclear material placed under safeguards and no indication of undeclared nuclear material or activities for the State as a whole. On this basis, the Secretariat concluded that all nuclear material within the territories of those States, under their jurisdiction or under their control anywhere had been placed under safeguards and remained in peaceful nuclear activities or was otherwise adequately accounted for.
- For 19 States (and for Taiwan, China), the Secretariat found no indication of the diversion of nuclear material placed under safeguards. Evaluations aimed at drawing a conclusion regarding the absence of undeclared nuclear material and activities for each of these States (and for Taiwan, China) as a whole remain in progress. On this basis, the Secretariat concluded for these States (and for Taiwan, China) that the nuclear material

placed under safeguards remained in peaceful nuclear activities or was otherwise adequately accounted for.

- The Islamic Republic of Iran and the Libyan Arab Jamahiriya, having been engaged in undeclared nuclear activities, were in breach of their obligations to comply with their respective safeguards agreements.

Safeguards activities were implemented for 98 States with comprehensive safeguards agreements in force but without additional protocols in force or being otherwise applied. For those States, the Secretariat found no indication of the diversion of nuclear material placed under safeguards. On this basis, the Secretariat concluded that for these States, the nuclear material placed under safeguards remained in peaceful nuclear activities or was otherwise adequately accounted for. As a result of the unilateral actions of the Democratic People's Republic of Korea (DPRK) to terminate the Agency's safeguards activities in late 2002, the Secretariat was not able to implement safeguards inspections in the DPRK in 2003 and could not, therefore, draw any safeguards conclusions in respect of nuclear material in that State.

Safeguards activities were implemented in four States with INFCIRC/66/Rev.2-type safeguards agreements in force. For those States, the Secretariat found no indication of the diversion of nuclear material or of the misuse of facilities, equipment or non-nuclear material placed under safeguards. On this basis, the Secretariat concluded that the nuclear material and other items placed under safeguards remained in peaceful nuclear activities or were otherwise adequately accounted for.

Safeguards activities were implemented in selected facilities in four of the five nuclear weapon States with voluntary offer safeguards agreements in force. For those States, the Secretariat found no indication of the diversion of nuclear material under safeguards. On this basis, the Secretariat concluded that the nuclear material under safeguards remained in peaceful nuclear activities or was otherwise adequately accounted for.

As of the end of 2003, 45 non-nuclear-weapon States party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) had not yet brought into force comprehensive safeguards agreements with the Agency as required by Article III of that treaty.

¹ In addition, the Agency applies safeguards, including the measures foreseen in the Model Additional Protocol (INFCIRC/540(Corr.)), in Taiwan, China.

For 44 of those States², the Secretariat could not implement safeguards and could not, therefore, draw any safeguards conclusions.

In Iraq, the Agency was able to implement its United Nations Security Council resolution-related mandate in 2003 until 17 March and, as of that time, had not found any evidence or plausible indication of the revival of a nuclear programme. Under its comprehensive safeguards agreement with Iraq, the Agency verified in June 2003 that, in spite of the looting that took place in April 2003, the amount of uranium that may have been dispersed was not of proliferation concern.

State Specific Issues

In 2003, a number of discoveries, disclosures, and political developments highlighted important challenges to the Agency's verification regime.

Democratic People's Republic of Korea. The DPRK has been in non-compliance with its safeguards agreement since 1993. Since 31 December 2002, when at the request of the DPRK the Agency's inspection activities were suspended, the Agency has not been able to verify that there has been no diversion of nuclear material in the DPRK. In January and February 2003, the Agency's Board of Governors adopted two resolutions which encouraged the DPRK to reconsider its decisions and comply with its safeguards agreement. In February 2003, the Agency informed all its Member States, the Security Council and the General Assembly of the United Nations about the DPRK's further non-compliance and the Agency's inability to verify the non-diversion of nuclear material subject to safeguards in the DPRK.

There are reports, which the Agency is not in a position to confirm, that the DPRK: may have reactivated its research reactor at Nyongbyong; may have completed the reprocessing of the 8000 spent fuel rods which had previously been under Agency safeguards; and may have an undeclared uranium enrichment programme. The Agency has requested clarification from the DPRK on the issue of the uranium enrichment programme, but no response was received as of the end of 2003.

Iraq. After the resumption of inspections in November 2002, the Agency was able to conduct field activities related to its United Nations Security Council (UNSC) mandate in Iraq for only two

² Cuba acceded to the NPT on 4 November 2002. However, in 2003 safeguards were still being applied under INFCIRC/66/Rev.2-type safeguards agreements.

and a half months in 2003 (see the next chapter, Verification in Iraq Pursuant to UNSC Resolutions). Since 17 March 2003, the Agency has been unable to perform its inspection activities in Iraq pursuant to its Security Council mandate, which remained valid.

Nuclear material stored at Location C at Tuwaittha is subject to safeguards under the comprehensive safeguards agreement between the Agency and Iraq. The material inventory consists of low enriched, natural and depleted uranium in various chemical forms; some of the material was reported as having been looted in April 2003. In June 2003, the Agency conducted an inspection, recovered and verified the nuclear material subject to safeguards at Location C and estimated that at least 10 kg of uranium compounds could have been dispersed as a result of the looting. The quantity and type of uranium compounds dispersed are not sensitive from the point of view of nuclear proliferation. Nonetheless, the Agency requested the Coalition Provisional Authority to make every effort to recover this material and place it once again under safeguards.

Islamic Republic of Iran (Iran). The Agency had extensive discussions with Iran in 2003 on safeguards issues to be clarified, and carried out a range of verification activities in the context of Iran's NPT safeguards agreement. Reports by the Director General were made to the Board of Governors in June, September and November 2003. The report in June noted that Iran had failed to meet its obligations under its safeguards agreement with respect to the reporting of nuclear material, the subsequent processing and use of that material, and the declaration of facilities where the material was stored and processed. The report also noted corrective actions that had been taken. In response, the Board shared the Director General's concern at the number of Iran's past failures, and welcomed its reaffirmed commitment to full transparency.

The report to the September Board noted an increased degree of cooperation with the Agency by Iran, although it also stated that information and access were at times slow in coming and incremental, observing that a number of important outstanding issues remained, particularly with regard to Iran's enrichment programme. In its resolution of 12 September, the Board expressed grave concern that Iran had still not enabled the Agency to provide the required assurances that all nuclear material had been declared and submitted to safeguards and that there were no undeclared nuclear activities in Iran. The Board also decided that a number of actions on Iran's part were essential and urgent for

Agency verification of the non-diversion of nuclear material.

The November report, while reiterating that Iran had in a number of instances over an extended period of time breached its obligation to comply with its safeguards agreement, stated that there was to date no proof that the previously undeclared nuclear material and activities were related to a nuclear weapons programme. However, it was noted that, given the past pattern of concealment, it would take some time before the Agency would be able to conclude that Iran's nuclear programme was exclusively for peaceful purposes. The Board responded in its resolution of 26 November by welcoming Iran's offer of active cooperation and openness and its positive response to the Board's previous demands, but also by strongly deploring Iran's past failures and breaches of its obligation to comply with its safeguards agreement.

On 10 November 2003, Iran conveyed its acceptance of the text of a protocol additional to its safeguards agreement, and it agreed to cooperate with the Agency in accordance with the provisions of the additional protocol pending its entry into force. On 18 December 2003, Iran signed a protocol additional to its safeguards agreement. Iran also informed the Director General that it had decided to voluntarily suspend, with effect from 10 November 2003, all enrichment and reprocessing activities as a confidence building measure. The Agency is continuing its efforts to verify the correctness and completeness of Iran's declarations on nuclear material and facilities. The remaining outstanding issues that need resolution in this regard continue to require Iran's active cooperation.

Libyan Arab Jamahiriya (Libya). On 19 December 2003, Libya announced its decision to eliminate all materials, equipments and programmes which lead to the production of internationally proscribed weapons, including nuclear weapons. Subsequently, Libya informed the Director General that it had been engaged for a number of years in the development of a uranium enrichment capability; however, to date, no industrial scale facility had been built, nor had any enriched uranium been produced. Libya's clandestine nuclear activities included the import of natural uranium, centrifuges and conversion equipment as well as drawings related to nuclear weapon fabrication. Under Libya's safeguards agreement some of these activities should have been reported to the Agency, but were not.

The Agency started an in-depth verification of Libya's undeclared nuclear activities with an initial

verification mission led by the Director General from 27 December 2003 to 1 January 2004. The Agency began the process of placing the previously undeclared nuclear material, along with the most sensitive equipment, under Agency seal.

Libya announced that as of 29 December 2003 it would act as if an additional protocol to its safeguards agreement were in force; it also stated its intention to pursue a policy of full transparency and active cooperation with the Agency. The Agency continues in its efforts to verify the correctness and completeness of Libya's declaration on nuclear material and facilities.

As part of its continuing verification process with Libya and Iran, the Agency is also investigating, with the support of Member States, the supply routes and the sources of sensitive nuclear technology and related equipment, and nuclear and non-nuclear material. It is continuing such investigations with a view to ensuring that the sensitive nuclear technologies and equipment found in Libya have not proliferated further.

Conclusion of Comprehensive Safeguards Agreements and Additional Protocols

Comprehensive Safeguards Agreements (CSAs). In the course of 2003, CSAs entered into force with Burkina Faso, Georgia and the United Arab Emirates, while the validity of Panama's Treaty of Tlatelolco CSA in the context of the NPT was confirmed through an exchange of letters, and CSAs were signed by Burkina Faso, Cuba, Mauritania and Tajikistan.

Additional protocols. Additional protocols entered into force for Burkina Faso, Chile, Cyprus, Democratic Republic of the Congo, Georgia, Iceland, Jamaica, Kuwait, Madagascar, and Mongolia. Denmark, France, Ireland and Italy informed the Agency of the ratification regarding their respective protocols in the course of 2003. By the end of the year, all of the 15 States that were Members of the European Union (13 non-nuclear-weapon States and 2 nuclear-weapon States) had provided such notifications.³

In addition, Burkina Faso, Cuba, Democratic Republic of the Congo, El Salvador, Iceland, Iran, Jamaica, Madagascar, Malta, Mauritania, Paraguay,

³ The additional protocols for 15 States of the European Union — France, the United Kingdom and the then 13 non-nuclear-weapon States of the European Union — and Euratom entered into force on 30 April 2004.

Tajikistan, and Togo signed additional protocols. As of the end of 2003, out of 71 States with significant nuclear activities, 46 States had not brought an additional protocol into force.

Towards More Effective and Efficient Verification

Recognizing the lack of sufficient resources, Member States increased the regular budget of the Agency's verification programme, which had been operating for more than 15 years under conditions of a zero real growth budget. For 2004, the budget was increased by 12.4%, with a further 3.3% increase foreseen for 2005. In 2003, the Agency carried out many activities aimed at strengthening safeguards, the most important of which are elaborated below.

Verification activities in the field. The Agency carried out 2363 inspections at 644 facilities and locations outside facilities, representing 9260 person-days of inspections. This included 1773 person-days carried out to verify the transfer of spent fuel to storage facilities in 13 States, representing an increase of 29% over 2002. In addition, 272 days of inspection effort were carried out for verifying the design of facilities with nuclear material, or under construction or being decommissioned.

Complementary access. Complementary access was conducted in 21 States in 2003. Performed under additional protocols, complementary access plays an important role in the drawing and maintenance of conclusions of the absence of undeclared nuclear material and activities, and is specifically reflected in State evaluations. Field trials were carried out in the Netherlands and in Finland to test practical arrangements between the State authorities, Euratom and the Agency for advance notification and implementation of complementary access.

Sample taking. Environmental sampling is a powerful tool for detecting undeclared nuclear material and activities. Compared with 2002, the number of environmental samples collected during inspections and complementary access increased by more than 100%.

Sample analysis. The Agency improved the application of the X ray fluorescence technique for screening cotton environmental swipe samples. The use of thermal ionization mass spectrometry for measuring extremely small quantities of uranium and plutonium in environmental samples was also improved. In addition, the Agency upgraded the application of secondary ion mass spectrometry for the analysis of uranium particles on swipe samples.

The Agency published procedures for qualifying candidate laboratories in the Agency's Network of Analytical Laboratories (NWAL) with regard to nuclear material and environmental sample analysis. In this regard, the acceptance of a Japanese laboratory into the NWAL will enable the Agency to increase its analytical capacity.

The Safeguards State Evaluation Process

In 2003, the Agency continued to refine its process of evaluating State nuclear activities and plans to provide the basis for drawing safeguards conclusions, resulting in more consistent and comprehensive State evaluations. The number of State Evaluation Reports (SERs) that the Agency prepared and reviewed in 2003 continued to grow: 59 were prepared and reviewed, 29 of which took account of declarations submitted by States pursuant to Article 2 of their additional protocols. An evaluation was also carried out for Taiwan, China.

Information analysis. The Agency developed new ways to analyse safeguards relevant information from open sources. Such analyses are integral to assessing a State's ability to carry out nuclear activities, including those involving proliferation sensitive technologies. Analysis of commercial satellite imagery, a further open source of information, was enhanced; further processing of such information can significantly improve the accuracy of information on nuclear sites.

Safeguards Approaches

In 2003, the Agency revised its policy and model safeguards approach for natural uranium conversion facilities in order to strengthen safeguards at such plants. Traditional practice had been to apply all safeguards measures specified in a comprehensive safeguards agreement only to the product of such plants, and not to the bulk of the material processed in them. The new policy foresees that safeguards measures are applied to all material in natural uranium conversion plants as soon as the material reaches a stage where it is "suitable for fuel fabrication or for being isotopically enriched" (para. 34(c) of INFCIRC/153). It also confirms that the Agency must receive design information for the entire plant. Preparations have begun for the implementation of the revised approach at natural uranium conversion plants.

The development and implementation of the facility specific safeguards approach⁴ for the Rokkasho Reprocessing Plant in Japan (RRP) proceeded according to schedule. The main achievements of this project included: submission of the proposed Facility Attachment to the Japanese Government for approval; development and near complete installation of the solution measurement and monitoring system; installation of the On-Site Laboratory infrastructure, including hot cells, glove boxes and utilities; and commencement of acceptance tests.

Another facility specific safeguards approach developed in 2003 for a hot cell at a nuclear facility in Switzerland takes into account the facility's specific design and uses both non-destructive analysis (NDA) and additional containment/surveillance measures. The Agency also adapted an existing fork detector NDA system to operate in unattended mode when measuring spent fuel assemblies in the hot cell. Also, a new facility specific safeguards approach based on surveillance cameras, including underwater cameras, was developed for a spent fuel storage facility in India. Both of these new approaches will reduce the need for inspector presence. The Agency also rehearsed enhanced inspection procedures at LEU fuel fabrication facilities in Japan.

Safeguards approaches developed for the spent fuel conditioning and dry storage facilities at the Chernobyl Nuclear Power Plant in Ukraine required the development of application specific monitoring equipment. In 2003, the prototype of a mobile monitoring system for container transport was installed at the spent fuel conditioning facility and, in collaboration with the facility operator, underwent cold and hot tests. The monitoring system for the spent fuel conditioning facility was assembled and tested at Agency Headquarters.

Procedures for design information verification were significantly improved. More specifically, facility specific design information verification plans were drafted. New tools to assist in design verification were introduced in 2003, such as a three dimensional scanning laser range finder — a tool that can produce a three dimensional image of a facility area or of equipment. The image can be stored and the system enables the Agency to electronically

⁴ A set of technical measures (such as verification measurements and containment/surveillance devices) chosen for the implementation of safeguards in a given facility. The approach takes into account the specific features of the facility and provides a capability to detect the diversion and undeclared production of nuclear material.

compare the original images with later images of the same facility area or equipment, and thus to identify design modifications over time.

Integrated Safeguards

Integrated safeguards are the optimum combination of all safeguards measures available to the Agency under comprehensive safeguards agreements and additional protocols that achieve the maximum effectiveness and efficiency within available resources. The Agency focused on several aspects related to integrated safeguards, which continued to be implemented at the State level in Australia and Norway and began in Indonesia. State specific integrated safeguards approaches are under development for Canada, Hungary, Japan, Poland, Slovenia and Uzbekistan. The Agency tested the unannounced inspection component of the integrated safeguards approach for Hungary.

Facility specific integrated safeguards approaches for Japan were further developed and refined. Throughout the year, there were trials of such approaches involving random interim inspections, particularly for LWRs without mixed oxide (MOX) fuel, research reactors and critical assemblies (RRCAs), and spent fuel storage facilities.

In order to facilitate the implementation of integrated safeguards, the Agency drew up guidelines for unannounced and short notice inspections and for dealing with anomalies, questions and inconsistencies. The Agency also formulated provisional implementation criteria for RRCAs, spent fuel storage facilities and LWRs without MOX.

Information Technology

The IAEA Safeguards Information System (ISIS), established in the mid-1970s, is now not only outdated but difficult and costly to maintain. Moreover, it limits the Agency's ability to integrate other IT applications. In recognition of this situation, a project was launched in 2002 to re-engineer the current information system. The development and implementation of the new system is expected to start in 2004 and be completed in three to four years. By the end of the year, extrabudgetary funding envisaged for the project over the period 2005–2007 was still short by some \$16 million of the resources needed for its completion.

The Agency introduced new IT tools in 2003. The 'Nuclear Accounting Data Warehouse', under development since 1997, will improve both the storage

and processing of information about nuclear material. More specifically, authorized Agency staff will be able to query nuclear material accounting data with more flexibility, i.e. at different levels of aggregation or detail. It also permits the visualization of nuclear material transfers within and between facilities.

Usually, nuclear facilities have their own electronic formats for nuclear material accounting data. A new tool allows inspectors to record these large data files electronically during inspections and obviates the need to input the data manually upon return to Headquarters. The Agency configured this software tool for seven additional facilities during 2003, thereby increasing the available number of facility-specific configurations to 47.

Verification Equipment

The Agency continuously seeks to upgrade or develop reliable and effective safeguards equipment for monitoring, containment, surveillance, NDA and other tasks to increase the efficiency of its verification measures. Following positive cost-benefit analyses, the Agency installed further unattended and remote monitoring systems in nuclear facilities to maintain continuity of knowledge and verify the movements of nuclear material. These systems, in particular new, unattended monitoring systems using radiation detection and other types of sensors, reduce the need for inspector presence in the field.

Ten new unattended monitoring systems were installed and five obsolete systems were replaced by newer units, bringing the total to 88 unattended

monitoring systems installed at 44 facilities in 22 States. Five remote monitoring systems, operating a total of 14 cameras, were installed. At the end of 2003, the Agency had a total of 44 remote monitoring systems in place, in 8 States, operating a total of 109 cameras.

The cost efficiency of unattended and remote monitoring systems depends on various factors, including installation, maintenance and communication costs. For that reason, the Agency began to implement a technology called Virtual Private Network, which allows for secure data transmission over the Internet and has the potential to reduce data transmission costs by up to 75%.

Spent fuel at an on-load reactor of unique design in Argentina is stored in two layers in the spent fuel pond. The lower level of the pond has so far been difficult to access, which is why the Agency developed a new method to allow the verification of spent fuel at the lower level. Specifically, digital surveillance and radiation monitoring instruments were integrated and deployed underwater for the first time in combination. This monitoring system is an example for the integration of non-destructive analysis and surveillance measures, which increases the effectiveness and efficiency of verification equipment.

Throughout 2003, the Agency implemented new safeguards approaches, with unattended monitoring systems as an integral part, for LWRs, storage facilities and transfers of spent fuel to dry storage. Unattended monitoring systems were installed at a hot cell and related dry storage facility in Canada to monitor transfers of uranium waste generated in the hot cell.

Table 1. Verification Activities

	2001	2002	2003
Person-days of inspection	10 314	10 084	9260
Number of new or revised Subsidiary Arrangements negotiated			
— General Parts	9	3	5
— Facility Attachments	10	12	17
Number of nuclear material samples analysed	831	736	678
Number of nuclear material analytical results reported	1747	1593	1426
Number of environmental samples screened	308	426	887
Nuclear material under safeguards (tonnes)			
Plutonium contained in irradiated fuel (including recycled plutonium in fuel elements in reactor cores)	690	731.6	770.3
Separated plutonium outside the reactor core	77.5	82.0	85.5
High enriched uranium	20.9	31.8	31.8
Low enriched uranium	50 079	51 226	52 972
Source material	94 940	96 410	102 252

Advanced thermo-hydraulic power monitors are used to monitor the power output of a research reactor and can verify that the output is consistent with the power level declared by the operator. More specifically, this system measures the water flow and temperatures in the primary coolant loop. The Agency improved its security features and reliability by means of sensor redundancy. The upgraded equipment was installed at a research reactor in Belgium and replaced older power monitor systems at research reactors in Indonesia, Japan and the Republic of Korea.

A new type of uranium enrichment monitoring system was installed at a uranium down-blending facility in the USA. This system comprises unattended measurement systems in the facility, which transmits the data to an accessible location. Furthermore, software was developed to interpret the data. This system reduces the duration and intrusiveness of inspections.

The Agency authorized upgraded NDA equipment for inspectors to verify the enrichment level and isotopic composition of both heavily shielded nuclear material and fuel assemblies at materials testing reactors during routine inspections. The Agency also developed new, more efficient software for core discharge monitor systems (used for unattended monitoring of fuel assembly transfers), which can count the numbers of spent fuel bundles discharged from the reactor. With Member State support, the Agency completed the development of a digital Cerenkov viewing device, which will permit verification in a non-intrusive way of spent fuel assemblies with a long cooling time, and/or low burnup, in spent fuel storage ponds.

A new measurement approach was developed, based on numerical simulation and NDA measurement, for difficult-to-access nuclear material at an Italian facility. This enabled the re-establishment of inventory.

The Agency built and tested and is now routinely using a specialized detector system to measure HEU fresh fuel assemblies at a research reactor facility in Germany. The system was developed in 2002 in co-operation with the European Union's Joint Research Centre in Ispra.

A new generation of electronic seal was developed incorporating advanced optics, electronics and cryptography. Evaluation of the new seal's performance began in early 2003.

The Agency completed the replacement of analog single camera surveillance systems with digital surveillance systems. The systematic replacement

of analog multi-camera surveillance systems continued.

Training

A variety of training courses was provided to Agency staff and State personnel. With the support of a Member State, the Agency carried out a feasibility study on establishing a certification programme for training safeguards inspectors. The Agency also developed a training course specifically for inspection support staff to give them additional in-depth knowledge and skills to more effectively carry out their work. The course incorporates new responsibilities stemming from the implementation of additional protocols.

The training curriculum on additional protocol measures was consolidated and harmonized. In addition, the introductory course for Agency safeguards was revised to include topics from advanced training courses.

Interaction with States and Outreach

Member State Support Programmes. Substantial contributions to Agency safeguards continued to be made through Member State Support Programmes, with overall contributions in 2003 exceeding \$21.3 million. Additionally, the Czech Republic and South Africa established support programmes.⁵ At the beginning of the year, 212 Member State Support Programme tasks were under way addressing such needs as: the development and/or refinement of safeguards concepts; the development of equipment and techniques; training; and improved information technology. Thirty-one such tasks were completed and five were terminated in 2003. Following a review of the remaining tasks and the launch of 43 new ones, there were 219 ongoing Member State Support Programme tasks at the end of 2003.

Consultation and outreach. The Agency again gave high priority to explaining the significance of and encouraging States to bring into force comprehensive safeguards agreements and additional protocols. In

⁵ States and organizations representing groups of States having formal support programmes: Argentina, Australia, Belgium, Canada, Czech Republic, EC, Finland, France, Germany, Hungary, Japan, Republic of Korea, Netherlands, Russian Federation, South Africa, Sweden, UK and USA. States having R&D contracts and test programmes: Austria, Israel, Latvia and Pakistan.

connection with four regional and one interregional outreach seminars hosted by the Agency, Malaysia, Romania and Uzbekistan, bilateral consultations on the conclusion and implementation of safeguards agreements and additional protocols were held with representatives of 47 States from all regions who participated in those seminars. National seminars were held in Colombia, Cuba, Haiti, the Islamic Republic of Iran, Malaysia and Thailand, while teams from Albania, Belarus, Cuba and Ukraine visited Vienna for consultations to expedite the entry into force of additional protocols.

Guidance for States. Shortly after the Board of Governors approved the Model Additional Protocol in 1997, guidelines were issued to help States prepare and submit their declarations to the Agency, under Articles 2 and 3 of the additional protocol, in a correct and timely manner. In 2003, the Agency revised the guidelines in the light of practical implementation experience and comments from States. In April, the Agency presented the proposed revision to representatives of 29 States at a technical meeting in London hosted by the United Kingdom Support Programme. The revised guidelines will be issued to States in 2004. A further refinement of the process was the possibility for States to transmit declarations electronically to the Agency over secure lines.

Other events. The Agency organized a technical meeting to review current and future needs for the verification of spent fuel in wet and dry storage facilities, to examine the status of existing spent fuel measurement technologies and to explore methodologies to improve existing capabilities. The recommendations of these experts regarding the refinement of spent fuel measurement methods were taken into account in the Agency's safeguards R&D programme for 2004.

A workshop was organized under the United States Support Programme on the 'Next Generation Surveillance System'. Participants discussed the role of surveillance as a verification tool, including current and future surveillance needs for safeguards. They also reviewed user and critical system requirements for the future surveillance system and, in addition, identified appropriate technologies to be employed which will be considered in the Agency's long term safeguards R&D programme.

Assistance to and cooperation with State Systems of Accounting and Control (SSACs). Throughout 2003, the Agency provided assistance to Member States, at both State and facility levels, to help them strengthen their SSACs. This assistance included technical advice, training and guidance. For example,

the Agency co-ordinated the upgrading of the nuclear material accounting and control system at the Ulba fuel fabrication facility in Kazakhstan. The parties involved have agreed on an action plan for this purpose and on providing equipment for material measurements. Further SSAC evaluation missions visited Armenia, Azerbaijan, Kyrgyzstan and Tajikistan. The Agency also provided computer hardware and software systems to three Member States to enhance the operation of their SSACs.

The Agency and Euratom agreed to implement safeguards in the non-nuclear-weapon States of Euratom following an approach which includes the common use of equipment, joint scheduling of inspections and special arrangements for inspection work and data sharing. The ongoing restructuring of Euratom has affected the Agency's verification implementation; for example, participation in inspections by Euratom has become irregular. Some practical arrangements of the 'New Partnership Approach' may need to be reviewed after Euratom's future role has been clarified. With regard to the expansion of the European Union, following the accession of ten States in May 2004, the Agency and Euratom have established a working group to introduce similarly cooperative measures for applying safeguards in accession States, and to address important issues associated with the implementation of additional protocols in the relevant States.

Twenty-two procedures for the common use of equipment are now being implemented by the Agency and by ABACC. A procedure has also been implemented for submitting official correspondence via encrypted e-mail.

The Agency's cooperation with the SSAC in the Republic of Korea was further enhanced through the use of remote monitoring systems. With regard to Japan, the joint use of equipment as well as the joint verification of spent fuel from LWRs has resulted in savings. An IAEA-Japan Task Force Group recommended further cooperative measures under both traditional and integrated safeguards.

During the General Conference in September 2003, one session of the Scientific Forum was held on 'Safeguards Technology: Challenges and Limitations'. The main topics for discussion were safeguards effectiveness through the use of new methods and equipment, such as open source information, including satellite imagery, and environmental sampling. An NGO forum was held in Vienna in February 2003, where the Agency's strengthened safeguards system was the focus of discussion with experts and research centres. ■