Y2K, SAFEGUARDS & PHYSICAL PROTECTION

PROGRESS & COOPERATION

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Under agreements with 138 countries, the IAEA applies safeguards and verification measures to provide assurance to the international community on the peaceful use of nuclear technologies. Nearly 900 nuclear facilities and other locations are under safeguards, and the Agency carried out about 2500 inspections last year. The Agency's safeguards system is a central component of the world's efforts to control the spread of nuclear weapons.

In the implementation of international safeguards, the Agency relies upon a range of digital equipment and computer systems. Included are more than 100 instrument and equipment systems authorized for inspection use, associated computer programs for the evaluation of data and reports, and a comprehensive accounting data system for storing and processing information reported by States.

The Year 2000 problem, or "millennium bug", poses major technical challenges to computer systems. Accordingly, it has drawn considerable attention over the past four years at the IAEA and within the international safeguards community of States and organizations. Y2K problems potentially could affect the application of safeguards, as well as systems for the physical protection of nuclear material. Steps taken by the IAEA and its Member States have led to significant progress in meeting the challenges.

At the IAEA, actions by the Department of Safeguards are very close to completion for the conversion of all related systems to make them Y2K compliant. The work included investigations and tests of the many instrumentation systems used for acquiring and evaluating safeguards data. Experts found that most systems were already Y2K compliant, that some did not require conversions, and that a few were not compliant. Associated software for these non-compliant systems is being phased out before the year 2000 transition. Additionally, the Department has assessed, converted, and tested specific computer applications and databases required for programme management, information processing, and communications support.

Entering July 1999, attention was directed at resolving any outstanding problems, and to reinforcing contacts on Y2K issues with authorities in Member States and organizations involved in the implementation of Agency safeguards around the world. The efforts focused on promoting the further exchange of information, providing guidance on remedial actions and contingency planning, and offering a forum for the exchange of information and technical expertise related to Y2K issues.

The work is part of follow-up action to an international seminar organized in February 1999 that addressed the Y2K problem as it relates to IAEA safeguards and physical protection of nuclear material. *(See box, page 22.)* Well in advance of the meeting, the Agency's Department of Safeguards had identified four major areas of importance for Member States and organizations. They were:

Nuclear material accountancy. Nuclear material accountancy, the basis for Agency verification activities, relies upon specific computer applications and systems, and close cooperation with authorities in Member States. In applying this measure, facility operators and the State's System of Accounting for and Control of nuclear material (SSAC) maintain records and file periodic reports to the Agency. The role of IAEA safeguards inspectors is to make independent measurements to verify quantitatively the amounts of nuclear material presented in the State's accounts. The activities are critical for effective implementation of safeguards and the verification of a State's declarations.

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Measurements and evaluation. Nuclear material produced, processed and used at safeguarded facilities and locations is measured and evaluated by the IAEA, facility operators and, in some cases, the SSAC. Measurements are done using non-destructive analysis equipment and associated systems. Accurate and reliable measurement systems are essential for effective verification of the nuclear material at the facilities.

Process control and monitoring systems. Systems for process control and monitoring are installed in nuclear facilities. These are primarily used for operational activities and mainly rely on computer-based systems and embedded components to function. These systems may also interface directly with nuclear material accounting and measurement systems.

Physical protection equipment systems. Physical protection measures are provided by States to protect nuclear material from theft and nuclear facilities from sabotage attempts. Physical protection systems include such equipment as access control devices, intrusion detection tools, closed circuit television, central alarm stations, and communication lines which rely on computer-based systems and embedded components to function.

EXCHANGING INFORMATION & EXPERIENCE

Over the past two years, the IAEA has focused on raising the awareness of potential Y2K problems related to safeguards and on the exchange of experience regarding remedial actions and contingency plans.

In early 1998, the IAEA sent a letter to Member States and organizations informing them of a Y2K problem that might affect the production of nuclear material accountancy reports. The letter offered two possible formats for reporting of dates within the accounts, and it requested the State to contact the Agency to indicate which date reporting form they preferred. Reminders were sent in early 1999 to States who had not responded. Additionally, the Agency sent a letter to Member States and organizations in October 1998 to specifically draw their attention to Y2K issues with regard to software related to safeguards equipment.

International Seminar. To foster greater awareness on these and other issues, the Agency convened an "International Seminar on the Year 2000 (Y2K): Progress and Cooperation" in early February 1999. Participating were representatives from 48 countries, as well as from companies involved in providing information technology services. The seminar consisted of ten sessions, and featured technical presentations and workshops. Forty papers were presented addressing various aspects of Y2K problems and national assessment programmes related to the four main subject areas of potential concern.

The Seminar provided a forum for States to report on their activities and to learn more about steps that the Agency has taken to address Y2K problems as they relate to safeguards instrumentation, application software, reporting systems, and physical protection issues. There were extensive discussions and exchanges, both during the meeting and in separate sessions, which identified common Y2K problems. Particular attention was devoted to contingency planning in the event of problems arising.

In conjunction with the Seminar, a questionnaire was issued to survey the status of Y2K preparations in Member States. The information collected is helping the Agency and individual States to determine the status of Y2K compliance and to identify areas where further assistance and guidance may be required. Responses so far have helped to identify specific Y2K problems and lay the basis for further action. The responses indicate that all States have started to identify the problems and most States are in the process of developing solutions. If assistance is required, it is principally related to rectifying the problem (as opposed to identifying it or seeking assistance in replacing the system).

During the Seminar, several States indicated that they need to update their accountancy software, and expressed an interest in receiving support in the form of advice or the provision of software.

In the area of measurements and evaluation, and process control and monitoring systems, the questionnaire results indicate that all States are working on identified problems, and expect to complete work between August

SHARING Y2K EXPERIENCE

Computer-based systems and analytical tools are essential features of the safeguards system.

Governmental delegates from nearly 50 countries met at the IAEA earlier this year to examine Y2K issues from the perspective of safeguards and physical protection activities. National reports at the international seminar reviewed actions that countries had taken, as well as specific problems they faced. A number of reports covered technical issues, including problems associated with embedded systems such as microprocessors or control devices. Others reviewed measures related to nuclear material accounting systems, safeguards equipment and instruments, and nuclear facilities within the context of Y2K assessment programmes.

Presentations at the seminar included those from the United Kingdom, United States, India, Thailand, Russian Federation, Indonesia, Argentina, China, Ukraine, Czech Republic, Slovakia, Sweden, Belarus, Kazakhstan, Canada, Japan, Romania, Bulgaria, Malaysia, Morocco, Scotland, and Poland. Additionally, a report from the European Atomic Energy Community (Euratom) reviewed the status of its safeguards reporting and instrumentation systems.

and October of this year. Among Member States responding to the questionnaire, 40% have reported that contingency plans have been developed in case the deadline is not met.

The Seminar's workshop on physical protection identified actions that state regulatory authorities should undertake, and actions that operators should take to analyze their physical protection systems, including the development of an action plan. Further, the participating experts made recommendations for drawing up contingency plans to be implemented should part or all of the physical protection systems fail.

The report of the workshop group is accessible on the IAEA's *WorldAtom* site. *(www.iaea.org/worldatom/program/protection.)*

FUTURE ACTIONS

As the months have passed, the IAEA's role as a co-ordinator and facilitator between States has taken on added importance for the effective exchange of information and technical assistance on Y2K issues. As a result of the Agency's past work and continuing liaison with Member States, various needs have been identified. These include:

- organizing assistance and/or training to help States evaluate existing accounting software, and upgrade it or develop new Y2K-compliant software;
- providing Y2K-compliant software when needed;
- providing guidance and assistance on physical protection issues;
- organizing assistance missions whereby an expert or small team of experts visits a State encountering problems and provides direct advice;
- establishing contingency plans.

By mid-1999, nine Member States had requested assistance. The requests are mostly in the area of equipment, SSAC software, and physical protection systems. The requests have been circulated to Member States who have indicated a willingness to provide technical or other assistance.

To review the overall state of affairs, the Department of Safeguards will be convening a Y2K working group later this year. This will give an opportunity, albeit with time running out, to take stock of progress, review actions that have been taken, and to consider any outstanding questions or problems that may require remedial measures. ❑