

March 5, 2004

Honorable Richard G. Lugar  
Chairman  
Committee on Foreign Relations  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

In response to your request, the Congressional Budget Office has prepared the attached analysis of the costs associated with ratifying the Protocol Additional to the Agreement Between the United States of America and the International Atomic Energy Agency Regarding Safeguards in the United States (Treaty Document 107-7). CBO estimates that one-time costs to the U.S. government for implementing the Additional Protocol would total between \$20 million and \$30 million, and recurring costs would total between \$10 million and \$15 million a year. Those costs would come from appropriated funds. CBO does not anticipate that any direct spending would result from ratification of the protocol.

If you would like further information about this analysis, we would be pleased to provide it. The CBO staff contact is Raymond J. Hall, who can be reached at 226-2840.

Sincerely,

Douglas Holtz-Eakin

Attachment

cc: Honorable Joseph R. Biden Jr.  
Ranking Member



**The Cost of Implementing  
the Additional Protocol  
to the Treaty on the  
Non-Proliferation of Nuclear Weapons**

**March 5, 2004**



Congress of the United States  
Congressional Budget Office

## **Summary**

On June 12, 1998, the United States signed the Protocol Additional to the Agreement Between the United States of America and the International Atomic Energy Agency (IAEA) Regarding Safeguards in the United States (commonly referred to as the Additional Protocol). The Additional Protocol is a bilateral agreement that would supplement and amend the verification arrangements that exist under the current agreement between the United States and the IAEA. The IAEA operates under the auspices of the United Nations and serves as the global focal point for counterproliferation activities.

All 135 member countries of the IAEA, including the United States, bear the direct costs for financing the IAEA's operations. The IAEA budget for 2004 totals \$385 million, with the likely contribution from the United States totaling \$118 million. The IAEA budget pays for several activities, including safeguard programs that verify through an inspection system that countries comply with their commitments to use nuclear material and facilities only for peaceful purposes. About \$160 million of the \$385 million budget has been allocated to those safeguard programs—for the salaries of about 230 inspectors and 200 administrative personnel, the cost of conducting roughly 900 inspections worldwide each year, and the cost of purchasing safeguard equipment.

Implementing the Additional Protocol in the United States would increase costs to the federal government in two ways, the Congressional Budget Office (CBO) estimates. First, the IAEA would incur costs to inspect additional facilities, which would most likely be borne by the United States. On the basis of information provided by the IAEA, CBO estimates that those costs would be about \$240,000 a year. Second, CBO estimates that several U.S. agencies would incur costs to implement the new safeguard measures required by the Additional Protocol. On the basis of data provided by those agencies, CBO estimates that one-time start-up costs in 2005 would total between \$20 million and \$30 million, and recurring costs thereafter would total between \$10 million and \$15 million a year. Most of those costs would be associated with protecting national security interests and helping to protect companies' proprietary information.

CBO also examined the potential impact on U.S. payments to the IAEA if the agency implemented additional protocols with other member countries. CBO expects that implementing the Additional Protocol with other member countries would increase the IAEA's operating costs. Whether those additional costs affected U.S. payments to the IAEA would depend on how those costs were paid for, however. If host countries fully reimbursed the IAEA for the costs of the additional inspections, U.S. payments to the agency would not increase. If countries failed to fully reimburse the IAEA for those inspections, the agency would need to include the costs in its regular budget or solicit additional voluntary

contributions. The IAEA Board of Governors recently approved a \$20 million increase in the agency's regular budget for 2004 and plans to increase that budget by another \$5 million by 2007. CBO estimates that the U.S. share of that increase will total about \$6 million a year. The IAEA hopes that the budget increases will cover the costs of the additional inspections outside the United States, but that outcome is not assured because the number of additional inspections that might be necessary is very uncertain.

Finally, CBO examined the ability of the U.S. government to support the Additional Protocol. On the basis of information from the State Department and other U.S. agencies, CBO believes that the United States could provide all needed staff and adequate budget resources to support the IAEA inspections that are likely under the Additional Protocol and to protect U.S. national security interests. Although CBO believes that the IAEA is ready to implement the broader safeguard measures in the United States, it has no basis for determining the IAEA's readiness to implement those measures in other countries.

## **The IAEA and the Establishment of International Safeguards**

The International Atomic Energy Agency was created in 1957 and is an affiliated agency of the United Nations that serves as the global headquarters for counterproliferation activities.

By 1964, five countries—the United States, Russia, the United Kingdom, France, and China—had acquired nuclear weapons. The United States and many other U.N. members were concerned that the number of countries with nuclear weapons could increase to around 30 by the 1980s. Those fears led to growing support for legally binding, international commitments and comprehensive safeguards to stop the further spread of nuclear weapons and to work toward their eventual elimination.

As a result, the Nuclear Non-Proliferation Treaty (NPT) was adopted in 1968 with the aims of preventing the spread of nuclear weapons and weapon technology, fostering the peaceful uses of nuclear energy, and furthering the goal of achieving general and complete disarmament. Today, nearly every country in the world is a signatory to the NPT. (Exceptions are India, Israel, and Pakistan, which never signed the treaty, and North Korea, which recently withdrew from the treaty.)

Every signatory of the NPT that does not have nuclear weapons is required to conclude a comprehensive safeguard agreement with the IAEA. Today, nearly all countries have done so, including the United States and the other four nations that

possess nuclear weapons, which have agreed to accept safeguards on certain peaceful nuclear activities.

### **NPT and the IAEA Safeguards in the United States**

The IAEA safeguards are a set of technical measures and activities by which the agency seeks to verify that nuclear material identified by each country is not diverted to nuclear weapons. Those safeguard measures include using physical barriers to control access to and the movement of nuclear material, using cameras to detect the movement of nuclear material, and conducting on-site inspections.

Under the terms of the NPT, the United States, Russia, the United Kingdom, France, and China are not subject to IAEA inspections. Instead, they voluntarily submit to inspections as a demonstration of cooperation with the IAEA and a show of support for safeguards. Since 1967, the United States has permitted inspections of its nuclear facilities—both public and private—excluding only those with direct national security significance. The existing safeguard agreement between the IAEA and the United States (sometimes called the Voluntary Offer) has been in effect since 1980.

Under the Voluntary Offer, the United States provided a list of roughly 245 commercial and governmental facilities that would be made available for IAEA inspections. All sites under the jurisdiction of the Department of Defense (DoD) were exempted from those inspections under national security exclusions. Since 1981, the IAEA has inspected 19 U.S. nuclear facilities: six civil nuclear reactors, six fuel-fabrication plants, six Department of Energy (DOE) facilities, and one additional site. In recent years, the IAEA has inspected four facilities that hold or process nuclear materials in excess of defense needs—the Y-12 National Security Complex in Oak Ridge, Tennessee; the Savannah River Site near Aiken, South Carolina; the Hanford Site in southeastern Washington State; and the BWX Technologies facility in Lynchburg, Virginia.

### **The Model Additional Protocol**

Most countries abide by their commitments to the IAEA and the NPT, but the IAEA safeguards attempt to also deal with those that do not. In the aftermath of the 1990 Gulf War, it became clear that Iraq's nuclear program was more advanced than had been previously assessed through regular IAEA inspections of declared facilities. That revelation pointed to important limitations of the safeguard agreements in place at the time. Those agreements focused on verifying declared nuclear material and activities rather than on addressing undeclared nuclear activities. Although the IAEA has taken steps to address those undeclared activities, continued shortcomings have led the United States to propose, and the international community to negotiate, measures to strengthen safeguards, including development of the Model Additional Protocol. That protocol forms the

basis for the Additional Protocol to the Treaty on the Non-Proliferation of Nuclear Weapons Between the United States and the IAEA.

The objective of the Model Additional Protocol is to verify the absence of undeclared nuclear activities in countries that do not have nuclear weapons. The Model Additional Protocol gives IAEA inspectors broader access to information about member countries' nuclear programs and broader physical access to both declared and undeclared locations. Under the protocol, countries not possessing nuclear weapons must provide declarations about all phases of their civil nuclear fuel cycle and related research and development.<sup>1</sup> They must also provide declarations about other locations where nuclear material intended for peaceful purposes is present and about the manufacture and export of materials, equipment, and facilities especially designed for nuclear use. That model protocol is the first major change to the IAEA safeguard system in 25 years.

Today, 78 countries have signed a Model Additional Protocol with the IAEA. The agency's goal is to have additional protocols signed with the remaining countries by 2005.

#### **The Additional Protocol Between the United States and the IAEA**

The U.S. Additional Protocol is based on the Model Addition Protocol but has some added features. Like the previous safeguard agreement, it exempts locations and activities of direct national security significance to the United States. In addition, the U.S. Additional Protocol protects commercial interests by restricting access to companies' confidential information.

In implementing the U.S. Additional Protocol, the U.S. government would initially provide the IAEA with a list of both public and private facilities that are declared sites under the protocol and, therefore, subject to inspection. Those sites would include private nuclear reactors, commercial facilities that manufacture parts used in the production of nuclear reactors, facilities that enrich or convert uranium, and universities that are conducting nuclear research. According to the Department of State, recent estimates place the potential number of sites that could be subject to the IAEA safeguards under the Additional Protocol at about 1,775. (About 1,000 of those sites are abandoned uranium ore mines, which would probably not be inspected.) The United States would be required to provide that list to the IAEA no more than 180 days after the United States declared that the Additional Protocol would take effect.

---

1. The nuclear fuel cycle refers to the series of steps that uranium goes through to be processed into an efficient fuel for use in applications such as the generation of electricity and in weapons.

## **The IAEA Budget**

The International Atomic Energy Agency prepares a regular budget each year to fund its programs. Every member country contributes to the regular budget based on an agreed assessment percentage. The IAEA also funds its programs through voluntary contributions from some countries, including the United States.

Funding for the IAEA's programs provided through both its regular budget and voluntary contributions has increased from about \$290 million in 1995 to \$385 million in 2004. Using information provided by the IAEA and the State Department, CBO estimates that the IAEA will spend about \$160 million (or about 40 percent) of its \$385 million budget on safeguard programs in 2004.

The IAEA's regular budget, which pays for safeguard costs along with the costs of science, safety, health, and environment programs, has grown from \$205 million in 1995 to \$245 million in 2003 because of agreements between the agency and its member countries to maintain an almost "zero-real-growth" budget over that period. Under that policy, the IAEA could only increase its budgets from year to year to adjust for the impact of inflation on such items as salaries and purchases. As a result, the agency has grown more dependent on voluntary contributions. Those contributions increased from about \$87 million in 1995 to an estimated \$120 million in 2004, primarily to support rising costs in the safeguard programs.

In light of the expansion of the IAEA's safeguards over the past 10 years, the agency's Board of Governors approved a real increase in the regular budget beginning in 2004. The budget rose to \$265 million in 2004 and will increase by another \$5 million (to \$270 million) by 2007. According to the IAEA, about \$19 million of that increase will be allocated to safeguard programs.

## **U.S. Spending for the IAEA**

The U.S. government provides funds in support of the IAEA's activities in three ways. First, since the IAEA is an affiliated agency of the United Nations, the United States makes payments toward the IAEA's regular budget as a member of the United Nations. Second, the United States makes voluntary contributions to the IAEA to help the agency meet its safeguard commitments. Finally, the U.S. Congress appropriates funds to federal agencies to pay for programs that support the IAEA's activities.

### **The U.S. Share of the IAEA's Regular Budget**

Historically, the United States has paid about 26 percent of the IAEA's regular budget. That share amounts to \$68 million in 2004.

The U.S. share of the IAEA's regular budget is paid from the "Contributions to International Organizations" account in budget function 150 (international



affairs), which is funded through annual appropriations to the State Department. Under a deferred-payment policy that has been in effect since the 1980s, the United States will use fiscal year 2005 appropriations to pay its 2004 assessment. The Administration's 2005 budget requests about \$69 million for that assessment—slightly higher than the IAEA assessment of \$68 million. Such differences arise because of varying assumptions about exchange rates.

### **The U.S. Voluntary Contribution**

The United States has long been the largest contributor to the IAEA's budget. Voluntary contributions to the agency from all nations totaled about \$120 million in 2003. Historically, the U.S. voluntary contribution has averaged about 45 percent of the IAEA's total voluntary contributions.

For 2004, the U.S. voluntary contribution will total \$53 million, the amount appropriated by the Congress. That contribution is made from the "Non-Proliferation, Antiterrorism, Demining, and Related Projects" (NADR) account in budget function 150 (international affairs), which is funded through annual appropriations to the State Department.

### **Other U.S. Costs Related to the IAEA's Safeguard Programs**

Besides contributing to the IAEA's regular budget and making additional voluntary contributions, the United States has historically allocated funds every year to U.S. government agencies to support the IAEA's safeguard activities. In 2004, DOE, DoD, the State Department, and the Nuclear Regulatory Commission (NRC) spent about \$40 million to support the IAEA's inspections within the United States (see Table 1).

DOE plans to spend \$34 million in 2004 on international safeguard programs. Those programs provide technology and expertise to strengthen IAEA's ability to detect undeclared nuclear material, support U.S. initiatives to promote adherence to the Nuclear Non-Proliferation Treaty and IAEA safeguard agreements, and oversee the implementation of those safeguards at U.S. facilities.

DoD plans to spend about \$5 million in support of IAEA efforts in 2004, performing environmental sample analysis in the United States for the IAEA. Currently, the Air Force's Technical Applications Center conducts about 400 sample analyses a year.

In 2004, the NRC plans to spend about \$1 million from its international nuclear safety support program to support IAEA safeguards. About four people will work with the IAEA inspectors full-time on nuclear security and proliferation activities.

Finally, the State Department’s Bureau of Non-Proliferation plans to spend about \$25 million in 2004 on efforts to reduce threats to the United States and its allies from the proliferation of nuclear, biological, and chemical weapons. On the basis of information provided by the State Department, CBO estimates that 10 to 15 people will support the IAEA’s efforts in the United States and abroad at a cost of about \$2 million a year.

**Table 1.**  
**Inspection Activities and Costs Related to IAEA Safeguards in 2004**

	Department of Energy	Department of Defense	Nuclear Regulatory Commission	Department of State	Total
Number of U.S. Sites Currently Eligible for IAEA Inspections	35	a	210	0	245
Number of U.S. Sites Currently Inspected by IAEA Each Month	3	0	1	0	4
U.S. Agency Costs (Millions of dollars)	34	5	1	2	42

SOURCE: Congressional Budget Office based on data provided by the State Department and the Administration’s 2005 budget justification materials.

a. DoD applies the national security exclusion to all of its facilities.

## **The Cost to the Federal Government of Implementing the U.S. Additional Protocol**

Implementing the Additional Protocol in the United States would increase costs to the federal government in two ways. First, the IAEA would incur costs to inspect more facilities in the United States. CBO estimates that those costs—about \$240,000—would most likely be recouped by an increase in either the IAEA’s regular budget or the U.S. voluntary contribution. Second, CBO estimates that several U.S. agencies would incur costs for implementing the new safeguard measures. CBO estimates that one-time start-up costs in 2005 would total

between \$20 million and \$30 million and recurring costs thereafter would total between \$10 million and \$15 million a year.

### **Increase in Costs to the IAEA**

Today, the IAEA conducts monthly inspections at three DOE sites and one commercial site. On the basis of information provided by the IAEA, CBO expects that any additional inspections that the agency would conduct under the Additional Protocol would be made in conjunction with those ongoing monthly visits to the United States. According to the IAEA, inspectors would probably travel to one additional commercial site during each visit to the United States. Information from the agency leads CBO to assume that a team of about 10 inspectors would spend one additional day in the United States conducting such an inspection, at a cost of about \$20,000. Since IAEA inspectors come to the United States 12 times a year to visit four sites under existing safeguards, the costs of 12 additional site inspections would amount to about \$240,000 a year, CBO estimates. The IAEA could recoup those costs either by increasing its regular budget or by asking the United States to raise its voluntary contribution. Consistent with the United States' current practice of completely reimbursing the IAEA for those expenses, CBO expects that the United States would pay for those costs. (The contributions would come from the State Department's NADR account.)

CBO's estimate of the IAEA's costs to carry out additional inspections in the United States is similar to the agency's estimate of between \$100,000 and \$200,000.

### **Increase in Costs to U.S. Agencies**

Implementing the Additional Protocol in the United States could also affect the budgets of the Department of Energy, the Department of Defense, the Department of Commerce (DOC), and the Nuclear Regulatory Commission. Taken together, the one-time start-up costs to those agencies of implementing the Additional Protocol would total between \$20 million and \$30 million in 2005, CBO estimates, and annual recurring costs would total between \$10 million and \$15 million after that. The estimate for each agency is discussed below.

**Department of Energy.** According to DOE, the number of its sites that would be eligible for inspections under the Additional Protocol would not change from today's level. From discussions with DOE, CBO anticipates that the costs to the department attendant with implementing the Additional Protocol would be those associated with conducting vulnerability assessments at roughly 35 facilities. Those assessments would be conducted to ensure that national security and commercial proprietary information are protected. On the basis of information provided by DOE, CBO expects that the department would conduct each

assessment using a team of approximately 10 engineers and that each assessment would take about five working days to complete and cost, on average, about \$220,000. Assuming that DOE needs to conduct about 50 assessments (one or two at each of its 35 sites), the one-time costs for those initial assessments would total about \$11 million in 2005, CBO estimates. DOE indicates that it would also conduct outreach efforts to help contractors prepare for the IAEA inspections. CBO estimates that those efforts would cost about \$1 million. In total, CBO estimates, the one-time start-up efforts would cost about \$12 million. DOE indicates that it would also need to conduct follow-up vulnerability assessments each year in support of the additional protocol. On the basis of information provided by DOE, CBO expects that the department would conduct annual follow-up assessments at about 10 sites a year. A follow-up assessment would cost about \$220,000. Thus, CBO estimates that the annual recurring costs of those follow-up assessments would total about \$2 million a year.

**Department of Defense.** DoD plans to apply the national security exclusion to all of its facilities, making none of them available to IAEA inspectors. However, DoD also has concerns about protecting national security interests at DOE labs, universities, fuel-fabrication plants, and commercial manufacturing sites made available for inspections under the Additional Protocol, because many of those sites perform work for DoD. (Information provided by the State Department indicates that the number of sites could exceed 500.)

DoD expects to have to conduct vulnerability assessments at some of those 500 sites. Each assessment would probably cost between \$80,000 and \$400,000, depending on the complexity of the assessment and whether DoD used contractor personnel. Current staffing levels could not complete the additional vulnerability assessments in a timely manner, and contractors would most likely be hired to conduct many of those assessments. DoD provided no information on the possible number of assessments that might be conducted in a year but indicated that the number would remain steady for the foreseeable future. Assuming that DoD conducts 25 to 50 vulnerability assessments a year, CBO estimates that the cost of those assessments would total between \$5 million and \$15 million a year.

**Nuclear Regulatory Commission.** The NRC expects that 30 additional facilities that it licenses would become eligible for IAEA inspections. According to the commission, it would be responsible for revising regulations to include the new requirements for implementing the Additional Protocol. NRC staff would also prepare guidance documents for IAEA access to commercial licensees and new reporting requirements. Recurring efforts would involve overseeing the information provided by licensees directly to the Web-based reporting system run by the Department of Commerce. The NRC estimates that those activities might require hiring one additional full-time employee. On the basis of information

provided by the NRC, CBO estimates that the commission's cost to implement the Additional Protocol would total about \$200,000 a year.

**Department of Commerce.** DOC's Bureau of Industry and Security would assist U.S. firms in complying with the IAEA's safeguard programs. Information provided by DOC indicates that about 500 commercial sites and 1,000 abandoned uranium mines could be made available for IAEA inspections. The IAEA does not inspect any of those commercial sites today, but DOC indicates that the IAEA would be likely to visit some of those sites under the new measures.

The Additional Protocol would require the nuclear industry—including public and private fuel-cycle facilities and nuclear power plants—to report certain information to the Department of Commerce. DOC is developing a new database specifically to support the reporting requirements of the Additional Protocol, called the Additional Protocol Reporting System (APRS). DOC estimates that the one-time cost for developing the APRS will total about \$2 million. DOC also estimates that additional one-time costs for outreach, training, and inspection support activities at the commercial facilities could total \$1 million in 2005. The department expects to spend about \$1 million a year thereafter for continuing the training efforts and maintaining the APRS database.

## **The Cost to the Private Sector and State and Local Governments of Implementing the U.S. Additional Protocol**

The Additional Protocol would require the commercial nuclear industry, including public and private fuel-cycle facilities and nuclear power plants, to submit to inspections by the IAEA. Affected facilities, in conjunction with the Nuclear Regulatory Commission, would certify their operations, allow the IAEA to inspect them, and report certain information to the Department of Commerce. According to industry sources, the NRC, its licensees, and certain related facilities already maintain the information that would have to be reported and have experience conducting similar types of inspections. The nuclear industry does not expect that the Additional Protocol would have a significant impact on the fees licensees pay to the NRC. Consequently, CBO estimates that the cost to nuclear facilities, both public and private, to comply with the protocol would be minimal. The Additional Protocol would not affect the budgets of the state and local commissions that regulate utilities.

## **Other Issues**

Implementing the additional protocols with other member countries would also increase the IAEA's operating costs. Those added costs could affect U.S.

payments to the agency, depending on how those costs were financed. Possible scenarios include:

- C A host country could fully reimburse the IAEA for the associated inspection costs, similar to the arrangement that currently exists between the United States and the agency. In that case, U.S. payments to the IAEA would not increase.
  
- C A host country could fail to fully reimburse the IAEA for those inspections. The agency would thus need to increase its regular budget or solicit larger voluntary contributions to cover the costs. As mentioned earlier, the IAEA Board of Governors approved a \$20 million increase in the regular budget for 2004 and plans to increase it by another \$5 million by 2007. CBO estimates that the U.S. share of that increase will total about \$6 million a year. The IAEA hopes that the budget increases will cover the costs of the additional inspections, but that outcome is not assured because the number of additional inspections that might be necessary is very uncertain.

CBO also assessed the ability of the U.S. government and the IAEA to support the Additional Protocol. On the basis of information from the State Department and other U.S. agencies, CBO believes that the United States government has made sufficient plans to ensure that necessary staff and budget resources will be available to support the IAEA inspections that might occur under the Additional Protocol and to protect U.S. national security interests.

Finally, CBO believes that the IAEA is ready to implement the broader safeguard measures under the Additional Protocol in the United States. However, CBO has no basis for determining the IAEA's readiness to implement the broader safeguard measures in other countries.