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NUCLEAR NONPROLIFERATION AND SAFETY

Concerns With the International Atomic Energy Agency's Technical Cooperation Program

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Resources, Community, and
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The Honorable Jesse A. Helms
Chairman, Committee on Foreign Relations
United States Senate

The Honorable Dan Burton
Chairman, Committee on Government Reform
and Oversight
House of Representatives

The Honorable Bob Graham
United States Senate

The Honorable Peter Deutsch
The Honorable Robert Menendez
House of Representatives

The International Atomic Energy Agency (IAEA)[1] has the dual role of promoting the peaceful uses of nuclear energy and verifying that nuclear materials under its supervision are not diverted to military purposes (safeguards).[2] Since 1958, in promoting the peaceful uses of nuclear energy through its technical cooperation program, IAEA has provided technical assistance to its member states by supplying equipment, expert services, and training that support the upgrading or establishment of nuclear techniques and facilities. Although the United States does not receive technical assistance, it has been the leading financial donor to IAEA's technical cooperation program.

In March 1997, we reported to you on IAEA's technical assistance for Cuba, including assistance for the partially completed Cuban nuclear power

[1]IAEA, an autonomous international organization affiliated with the United Nations, was established in Vienna, Austria, in 1957. IAEA's principal policy-making organizations are the General Conference, composed of representatives of the 124 IAEA member states; its decision-making body, the 35-member Board of Governors; and a Secretariat headed by a Director General. The United States is a permanent member of IAEA's Board of Governors.

[2]In the early 1960s, IAEA established an inspection program based on a system of technical measures, referred to as safeguards, designed to detect the diversion of significant quantities of nuclear material. The 1970 Treaty on the Non-Proliferation of Nuclear Weapons expanded IAEA's safeguards responsibilities because it required signatory non-nuclear-weapon states to agree not to acquire nuclear weapons and to accept IAEA's safeguards for all nuclear material used for peaceful nuclear activities. Both the nonproliferation treaty and the Treaty of Tlatelolco—which prohibits nuclear weapons in signatory Latin American countries—bind signatories to blanket nonproliferation agreements for their entire nuclear program and require inspections of all nuclear facilities by IAEA, known as "full-scope" safeguards.

reactors whose construction is suspended.[3] As requested, this report examines (1) the purpose and effectiveness of IAEA's technical cooperation program, (2) the cost of U.S. participation in IAEA's technical cooperation program, and (3) whether the United States ensures that the activities of IAEA's technical cooperation program do not conflict with U.S. nuclear nonproliferation and safety goals.

Results in Brief

While the United States and other IAEA major donor countries believe that applying safeguards is IAEA's most important function, most developing countries believe that receiving technical assistance through IAEA's technical cooperation program is just as important. The United States and other major donors principally participate in the program to help ensure that the member states fully support IAEA's safeguards and the 1970 Treaty on the Non-Proliferation of Nuclear Weapons. In the past, the United States and other major donors raised concerns about the effectiveness and efficiency of the technical cooperation program.[4] For example, the United States expressed concern that some technical assistance projects were devoid of significant technical, health, or socioeconomic benefit to the recipient country. Most of IAEA's program evaluation reports, internal audits, and project files that we reviewed, covering the period from 1985 through 1996, did not assess the impact of the technical cooperation program, and no performance criteria had been established to help measure the success or failure of the program. For the past 5 years, IAEA's Deputy Director General for Technical Cooperation has been taking steps to improve the overall effectiveness and efficiency of the program, including establishing a system for measuring the performance of some of its projects. The United States and other major donors strongly support these initiatives, but State Department officials are concerned about their sustainability.

The United States provided a voluntary contribution of about $16 million, or about 32 percent of the total $49 million paid by IAEA member states to the technical cooperation fund for 1996. The United States has historically been the largest financial donor to the fund. Because many IAEA member states are not paying into the technical cooperation fund, some member states, including the United States and Japan, are carrying the program

[3]See Nuclear Safety: International Atomic Energy Agency's Nuclear Technical Assistance for Cuba (GAO/RCED-97-72, Mar. 24, 1997).

[4]Fourteen member states—known as the Geneva Group—are major donors to United Nations agencies, including IAEA. These major donors are Australia, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, the Russian Federation, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

financially. Specifically, for 1996, 72, or about 58 percent, of the 124 IAEA member states made no payments at all to the technical cooperation fund, yet most of these states received technical assistance from IAEA.

Officials from the Department of State, the Arms Control and Disarmament Agency, and the U.S. Mission to the United Nations System Organizations in Vienna, Austria, told us that they do not systematically review or monitor all of IAEA's technical assistance projects to ensure that they do not conflict with U.S. nuclear nonproliferation or safety goals. However, we found that U.S. officials had sporadically reviewed projects in countries of concern to the United States. U.S. officials also told us that the vast majority of IAEA's technical assistance projects do not pose any concerns about nuclear proliferation because the assistance is generally in areas, such as medicine and agriculture, that do not involve the transfer of sensitive nuclear materials and technologies. However, we found that IAEA has provided nuclear technical assistance projects for Iran, North Korea, and Cuba—all countries where the United States is concerned about nuclear proliferation and threats to nuclear safety. For example, although the United States strongly opposes the completion of Iran's Bushehr nuclear power plant because civilian nuclear technology and training could help advance Iran's nuclear weapons program, IAEA has budgeted, for 1995 through 1999, about $1.3 million in technical assistance related to Iran's efforts to complete the plant. Moreover, a portion of the funds for projects in countries of concern to the United States is coming from U.S. voluntary contributions to IAEA.

Background

Under its 1957 statute, IAEA is authorized, among other things, to facilitate the peaceful uses of nuclear energy, including the production of electric power, by supplying materials, services, equipment and facilities to its member states, particularly considering the needs of the developing countries. About 90 countries receive technical assistance, mostly through over 1,000 projects in IAEA's technical cooperation program. IAEA' s technical cooperation program funds projects in 10 major program areas, including agriculture, the development of member states' commercial nuclear power programs, and nuclear safety. The average cost of a member state's technical assistance project is about $60,000.

IAEA provided about $800 million in technical assistance to its member states from 1958 through 1996, for equipment, expert services, training, and subcontracts (agreements between IAEA and a third party to provide services to IAEA member states). IAEA's training activities include

fellowships, scientific visits, and training courses. Egypt was the largest recipient of IAEA's technical assistance overall. About 44 percent of the assistance was spent for equipment, and—from 1980 through 1996—about half of the funds were provided for assistance in three program areas—the application of isotopes and radiation in agriculture, general atomic energy development, and safety in nuclear energy. For 1997 through 1998, IAEA approved $154 million more in technical assistance for its member states.[5]

Technical assistance projects are approved by IAEA's Board of Governors for a 2-year programming cycle, and member states are required to submit written project proposals to IAEA 1 year before the start of the programming cycle. The proposals are appraised for funding by IAEA staff and IAEA member states in terms of the projects' technical and practical feasibility, national development priorities, and the projects' long-term advantages to the recipient countries. Because IAEA's full-scope safeguards, as embodied in the 1970 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), emerged after IAEA was established, all IAEA member states in good standing are eligible for the same privileges, including receiving technical assistance. IAEA does not bar technical assistance for member states that do not have IAEA's full-scope safeguards or are not parties to the NPT. For example, Pakistan, Israel, and Cuba receive IAEA's technical assistance but do not have full-scope safeguards and are not parties to the NPT.[6]

U.S. participation in IAEA's technical cooperation program is coordinated through an interagency group—the International Nuclear Technology Liaison Office—which is chaired by the Department of State and includes representatives from the Department of Energy (DOE), the Arms Control and Disarmament Agency (ACDA), and the Nuclear Regulatory Commission (NRC). The United States also maintains a presence at IAEA through the U.S. Mission to the United Nations System Organizations in Vienna, Austria. U.S. contractors from Argonne National Laboratory and the National Academy of Sciences/National Research Council support U.S. training and fellowship activities for the program. In addition to developing and

[5]According to IAEA officials, about $45 million of this amount is for projects that are currently unfunded.

[6]India is also not a party to the NPT, but it has not requested technical assistance from IAEA since 1979. Cuba signed the Treaty of Tlatelolco in March 1995 but has not ratified it. According to State Department officials, despite Cuba's failure to accept IAEA's full-scope safeguards, all of Cuba's nuclear facilities are subject to safeguards under separate, legally binding agreements between IAEA and Cuba. In addition, IAEA member states that receive technical assistance must sign a revised supplementary agreement to ensure that the technical assistance they receive will be used only for the peaceful applications of atomic energy and that the technical assistance projects in their country will be subject to IAEA's safeguards.

coordinating U.S. policy towards IAEA's technical cooperation program, the interagency group (1) proposes and recommends U.S. support for specific projects—known as "footnote a" projects—only in IAEA member states that are parties to the NPT or other nuclear nonproliferation treaties;[7] (2) selects courses and participants for U.S.-hosted IAEA training courses and places IAEA fellows at U.S. institutions, such as national laboratories and universities; (3) facilitates purchases of U.S. equipment on behalf of IAEA; (4) recommends U.S. experts and consultants to represent the United States at IAEA meetings, conferences, and symposia; and (5) recruits U.S. nationals to provide expert advice to IAEA and to staff IAEA's operations. In addition, according to a U.S. Mission official, almost 200 U.S. nationals are employed by IAEA.

Purpose and Effectiveness of IAEA's Technical Cooperation Program

U.S. officials and representatives of other IAEA major donor countries told us that the principal purpose of IAEA's technical cooperation program is to help ensure that IAEA member states, many of whom are developing countries, support IAEA's safeguards and the NPT. Most of the member states participate in IAEA primarily for the nuclear technical assistance it provides. In the past, the United States and other major donors raised concerns about the effectiveness and efficiency of the technical cooperation program. However, since 1992, IAEA has been implementing improvements to the program that the United States and other IAEA member states strongly support.

IAEA's Technical Cooperation Program Helps Ensure Support for Safeguards and the NPT

While the United States and other IAEA major donor countries believe that applying safeguards is IAEA's most important function, most developing countries believe that receiving technical assistance through the technical cooperation program is just as important, and they participate in IAEA primarily for the technical assistance it provides. State Department, ACDA, and NRC officials told us that the principal purpose of U.S. participation in IAEA's technical cooperation program is to help ensure that IAEA member states, many of whom are developing countries, support IAEA's nuclear safeguards system and the NPT. A State Department document noted that the United States regarded support for the technical cooperation program to developing countries as the "price tag" for safeguards. At an October 1996 meeting, IAEA's Director General told us that the opportunity

[7]"Footnote a" projects are funded through extrabudgetary cash contributions by IAEA member states that are in addition to these states' contributions to IAEA's technical cooperation fund. IAEA considers these projects to be technically sound, but recipient states consider them to be a lower priority than the projects that are funded through the technical cooperation fund.

to receive technical assistance dissuades member states from engaging in the proliferation of nuclear weapons.

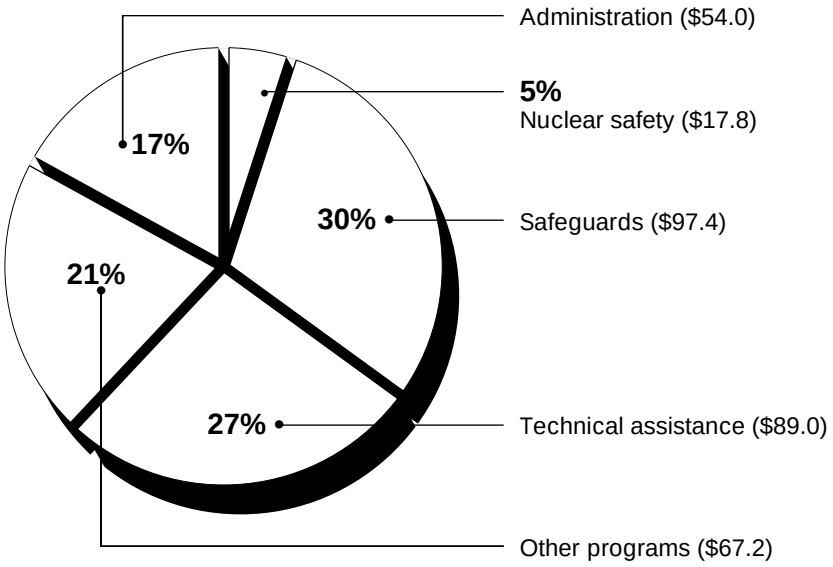
Representatives from four IAEA major donor countries—Australia, Canada, Germany, and Japan—told us that they generally agree with U.S. views that technical assistance is necessary to ensure that developing countries support safeguards and the NPT. However, representatives from six developing countries that have benefited from IAEA's technical assistance—Argentina, Brazil, China, India, Pakistan, and South Africa—told us that their countries participate in IAEA primarily because their participation enables them to receive technical assistance.[8] According to the representatives from India, Pakistan, and South Africa, IAEA would simply become an international "policing" organization for monitoring compliance with safeguards if IAEA did not provide technical assistance. A U.S. Mission official stated that several member states, including India and Pakistan, would be likely to withdraw from IAEA if its technical assistance were severely scaled back.

According to IAEA officials, IAEA carries out its dual responsibilities and manages the competing interests of its member states by maintaining a balance in funding between providing technical assistance and ensuring compliance with safeguards. As figure 1 shows, in 1996, IAEA spent about $97 million on safeguards and about $89 million on technical assistance, accounting for approximately 30 percent and 27 percent, respectively, of IAEA's total expenditures of about $325 million.[9]

[8]Of the about 90 member states that receive IAEA's technical assistance, 74 do not have operating nuclear power plants. About 20 of the member states are considered to be "least-developed" countries.

[9]Funding for safeguards comes from IAEA's regular budget and from extrabudgetary contributions by member states. Funding for technical assistance comes from voluntary contributions to IAEA's technical cooperation fund, extrabudgetary contributions from the United Nations Development Program and from member states for "footnote a" projects, and a portion of IAEA's regular budget for administration and support.

Figure 1: IAEA's 1996 Expenditures, by Major Activity



Note: Dollars in millions.

Source: IAEA.

Concerns About the Effectiveness and Efficiency of IAEA's Technical Cooperation Program Led to IAEA Initiatives to Improve the Program

In the past, officials in the United States and other IAEA major donor countries had concerns about the effectiveness and efficiency of the technical cooperation program. A 1993 State Department cable stated that the United States had long been concerned that "footnote a" projects were devoid of significant technical, health, or socioeconomic benefit to the recipient country. Some of the evaluations that we reviewed indicated other deficiencies in the technical cooperation program. For example, an October 1993 special evaluation review of lessons learned from completed evaluation reviews noted that inadequate project plans and designs resulted in implementation problems and delays in 30 percent of the technical assistance projects reviewed from 1988 through 1993. Some of the negative effects IAEA cited that resulted from insufficient project planning included (1) approving a 2-year project without obtaining sufficient evidence about its feasibility; (2) planning research reactor activities that did not yield significant results because they were premature or ambitious in relation to local resources; and (3) conducting

nuclear physics projects in Africa that lacked clear results and benefits to the recipient country.

IAEA officials in the Department of Technical Cooperation told us they have not prepared a comprehensive report on the accomplishments of the program since its inception in 1958. Although IAEA has provided its member states with detailed descriptions of all of its technical assistance projects, it did not assess the success or failure of these projects in the past. According to the head of IAEA's Department of Technical Cooperation's Evaluation Section, evaluations of projects' impact were not required because IAEA was focusing on the efficiency of projects' implementation. Moreover, IAEA stated that in 1993, the technical cooperation program's priorities shifted from implementing research and infrastructure-building activities efficiently to designing projects that have an impact on the end-user and provide nuclear science and technology activities that contribute to national development. IAEA noted that it is unrealistic to expect impact analyses of projects designed and implemented according to standards that did not embody measures of impact at the time. In the year 2000, IAEA plans to review the program's performance against the criteria for success contained in IAEA's strategy for technical cooperation.

We reviewed 40 reports prepared by IAEA's Department of Technical Cooperation's Evaluation Section and summaries of four audits of the program prepared by IAEA's Office of Internal Audit and Evaluation Support, which covered the period from 1985 through 1996, to determine whether they contained assessments of the program's effectiveness.[10] We found that most of the 40 reports and audit summaries did not assess the impact of specific technical assistance projects, and no performance criteria had been established to help measure the success or failure of the projects. The evaluations and audits were also limited because insufficient travel funds generally precluded visits by IAEA staff to the recipient nations.[11] We also reviewed the project files for four selected technical assistance projects in Iran, North Korea, Bulgaria, and Egypt that had been completed or canceled by IAEA. None of the project files we reviewed contained information on the project's accomplishments. Our review of other project files was limited by IAEA's policy on confidentiality, which

[10]Of the 40 IAEA reports that we reviewed, fewer than half were project or program evaluation reports. The remaining reports were country program summaries that provided an inventory of selected member states' projects by program area.

[11]IAEA devotes 1 percent of its resources in the technical cooperation program to program evaluation. Several major donor countries have expressed a desire to maintain this limit.

regards information obtained by IAEA under a technical cooperation project as belonging to the country receiving the project. Under this policy, IAEA cannot divulge information about a project without the formal consent of the receiving country's government.

Since 1992, IAEA's Deputy Director General for Technical Cooperation has taken steps to improve the effectiveness and efficiency of the technical cooperation program. For example, IAEA is establishing a system for measuring the quality and performance of some of its technical assistance projects. However, in 1996, IAEA's Secretariat reported to the Board of Governors that outcomes were still clearly defined for only 25 percent of the 90 technical assistance projects whose results they had monitored from January through October 1996. The Evaluation Section of IAEA's Department of Technical Cooperation is also helping the department to establish criteria for measuring the results of a project while planning it. The United States and other IAEA major donor countries strongly support IAEA's efforts to improve the effectiveness and efficiency of the program, but U.S. officials are concerned that all of the improvements may not be fully implemented and made permanent in the 2 years before the term of the current Deputy Director General for Technical Cooperation ends. (App. I discusses the status of IAEA's efforts to improve the effectiveness and efficiency of the technical cooperation program and the U.S. position on these actions.) According to a State Department cable describing the results of meetings held in September 1996, the major donors in attendance were highly supportive of IAEA's initiatives to improve the program. The donors concluded that they were

- under increasing pressure at home to demonstrate that their countries' contributions to IAEA were being well spent;
- supportive of the Deputy Director General for Technical Cooperation's efforts to make the entire technical cooperation program more efficient and effective;
- concerned because the technical cooperation program had not set priorities or established a schedule for accomplishing improvements to the program; and
- concerned that IAEA's Department of Technical Cooperation may not have the management skills required to accomplish these improvements.

More recently, during the Board of Governors' June 1997 meeting, the members highly praised IAEA's efforts in carrying out its initiatives to improve the effectiveness and efficiency of the technical cooperation program.

Cost of U.S. Participation in IAEA's Technical Cooperation Program

Most of the funding for IAEA's technical cooperation program—about 70 percent—comes from voluntary contributions made by member states to IAEA's technical cooperation fund. In 1996, the United States provided a total of about $99 million to IAEA, which consisted of about $63 million for IAEA's regular budget and an additional voluntary contribution of $36 million. About $16 million of the $36 million U.S. voluntary contribution to IAEA went to the technical cooperation fund; this contribution represented about 32 percent of the fund, which totaled $49 million. The remainder of the U.S. voluntary contribution to IAEA—about $20 million—was spent on other forms of support for the technical cooperation program, including (1) U.S.-hosted IAEA training courses, (2) "footnote a" projects, (3) placements of IAEA fellows at U.S. institutions, (4) the services of U.S. experts, and (5) support for other IAEA programs, including safeguards. In 1996, the United States was the largest single supplier of equipment for the program. (App. II provides information on the sources of funding for IAEA's technical assistance program from 1958 through 1996.)

Because many IAEA member states are not paying into the technical cooperation fund, the United States and some other major donors are paying for a larger percentage of the fund than designated. IAEA has informally adopted a target funding level for member states' contributions to the technical cooperation fund. IAEA's data show that, as of August 1997, 52 of 124 member states had paid into the 1996 technical cooperation fund. The United States and Japan contributed the most, accounting for over half of the total payments to the fund. Seventy-two—or 58 percent—of the member states made no payments at all, yet 57 of these states received technical assistance. In a statement made to IAEA's Board of Governors in June 1996, the U.S. Ambassador to the U.S. Mission to the United Nations System Organizations in Vienna, Austria, observed that the United States strongly believed that IAEA's technical assistance should go only to those member states that support technical assistance fully, by paying their fair share. The Ambassador further noted that, because many IAEA member states are not paying their designated share of the technical cooperation fund, some member states, including the United States and Japan, are carrying the program financially, by paying more than their share. (App. III lists the IAEA member states and their shares of and payments to the 1996 technical cooperation fund.)

The Ambassador of the Permanent Mission of the Republic of South Africa in Vienna, Austria, who chairs IAEA's Informal Consultative Working Group on the Financing of Technical Assistance, told us that the group was

designed to, among other things, encourage member states to increase their payments to the fund and to review whether member states that have not regularly paid into the fund should receive the benefits of IAEA's technical assistance. The Ambassador from South Africa also told us that many of the developing countries that are members of IAEA believe that funding for the technical cooperation program should be predictable and assured and have proposed that the program be funded through member states' contributions to IAEA's regular budget. The major donors do not support this proposal because they believe that the program will be adequately funded if all member states provide financial support for the program. Representatives of the major recipients of IAEA's technical assistance, including Argentina, China, Pakistan, and South Africa, told us that they are concerned that some major donors are considering reducing their voluntary contributions to IAEA, which fund the technical cooperation program. Canadian and German representatives told us that their countries may reduce their voluntary contributions to IAEA because of budget constraints. In a statement before the June 1997 meeting of IAEA's Board of Governors, the Ambassador from South Africa said that the members of the working group were deeply divided on whether to put the technical cooperation fund into IAEA's regular budget. She believed, however, that IAEA should take member states' records of payment to the technical cooperation fund into account in deciding upon requests for technical assistance. IAEA officials stated that they took member states' past payments to the fund into account when preparing for their 1997-98 program.

U.S. Officials Do Not Systematically Monitor Projects for Consistency With U.S. Nuclear Nonproliferation and Safety Goals

U.S. officials do not systematically review or monitor all of IAEA's technical assistance projects to ensure that IAEA's activities do not conflict with U.S. nuclear nonproliferation and safety goals. We found that U.S. officials had sporadically reviewed projects in countries of concern to the United States. Several of IAEA's technical assistance projects were related to a nuclear power plant under construction in Iran, to uranium prospecting and exploration in North Korea, and to a nuclear power plant whose construction has been suspended in Cuba. These are countries where the United States has concerns about nuclear proliferation and threats to nuclear safety. Moreover, since 1996, a portion of the funds for projects in countries of concern to the United States has come from U.S. voluntary contributions to IAEA.

U.S. Officials' Reviews of Technical Assistance Projects Are Sporadic

The Special Assistant to the U.S. Representative to IAEA in the State Department's Bureau of Political-Military Affairs told us that the State Department, in conjunction with its contractor at the Argonne National Laboratory, is chiefly responsible for reviewing IAEA's technical assistance projects for consistency with U.S. nonproliferation and safety goals before the projects are approved by IAEA's Board of Governors. However, we found that although U.S. officials at the State Department and U.S. Mission have reviewed technical assistance projects in countries of concern to the United States sporadically, they have not done so systematically. Officials in IAEA's Department of Technical Cooperation told us that they do coordinate with IAEA's Department of Safeguards in reviewing projects that may involve the transfer of nuclear materials or other items with implications for proliferation. We also spoke with officials in IAEA's Department of Safeguards to determine whether they systematically review all of IAEA's technical assistance projects for consistency with nonproliferation goals. These IAEA officials told us that they do not.

We found that the International Nuclear Technology Liaison Office—the interagency group that coordinates U.S. participation in the technical cooperation program and includes representatives from the State Department, DOE, ACDA, and NRC—and the U.S. contractor at Argonne National Laboratory focus their review on the "footnote a" projects that the United States may want to support with U.S. funds. The interagency group does not systematically review the majority of the technical assistance projects that are proposed for funding through IAEA's technical cooperation fund. Neither does it regularly monitor ongoing projects. An Argonne official informed us that he reviews the list of "footnote a" projects to determine whether they have technical merit and should be funded by the United States; however, he is not responsible for assessing whether these or other projects funded through the technical cooperation fund are in keeping with U.S. nuclear nonproliferation and safety goals. State Department officials in the Bureau of International Organization Affairs told us that the Department did not have the resources to review all of the ongoing technical assistance projects and that U.S. oversight of these projects could be improved.

ACDA, DOE, and U.S. Mission officials told us that the vast majority of IAEA's technical assistance projects do not pose any concerns about nuclear proliferation because the assistance is provided in benign areas, such as medicine and agriculture, that do not involve transferring sensitive nuclear

materials and technologies.[12] IAEA's Director General also told us that IAEA will not provide technical assistance in sensitive areas, such as the reprocessing and enrichment of nuclear material. State Department and U.S. Mission officials told us that if the United States does have concerns about specific technical assistance projects, it can informally raise its objections to IAEA's Secretariat. However, U.S. officials we spoke with generally could not recall whether the United States had raised objections or had attempted to cancel any projects in the past several years. These U.S. officials also said that the United States does not have absolute control over the approval of specific technical assistance projects because decisions about approving and funding the projects are made collectively every 2 years at the December meeting of IAEA's Board of Governors.

A former U.S. Mission official told us that U.S. Mission representatives can meet informally with IAEA staff to discuss a preliminary list of technical assistance projects months before the Board of Governors' meeting. The United States and other IAEA member states also have an opportunity to formally review the proposed list of technical assistance projects at IAEA's General Conference in September and at the November meeting of the Technical Assistance and Cooperation Committee, the final meeting where member states can provide recommendations for the December Board of Governors' meeting. U.S. officials told us that by the time the list of technical assistance projects reaches the Board of Governors, IAEA member states consider the projects to be approved. The U.S. officials added that it would be rare for representatives from the United States or any other member state to object formally to a specific technical assistance project during a meeting of IAEA's Board of Governors.

IAEA Provides Technical Assistance for Several Projects in Countries of Concern

Of the total amount in technical assistance (about $800 million) that IAEA provided from 1958 through 1996 for its member states, about $52 million was spent on technical assistance for countries of concern to the United States, as defined by section 307(a) of the Foreign Assistance Act of 1961, as amended. These countries include Cuba, Libya, Iran, Myanmar (formerly Burma), Iraq, North Korea, and Syria.[13] Iran and Cuba ranked 19th and 21st, respectively, among the 120 nations that received assistance

[12]Our analysis of the technical assistance that IAEA provided to its member states by program area, from 1980 through 1996, shows that most of IAEA's assistance was provided in three program areas—the application of isotopes and radiation in agriculture, general atomic energy development, and safety in nuclear energy—as discussed in app. IV.

[13]The Palestine Liberation Organization is also covered under the act but is considered to be a political entity and is thus not a member of IAEA. North Korea has not received technical assistance since it withdrew from IAEA in June 1994.

over this period, receiving about 1.5 percent each of the total amount in technical assistance that IAEA provided. Projects IAEA provided for these countries involved nuclear training and techniques in medicine and agriculture, including establishing laboratory facilities for the production of radiopharmaceuticals in Iran and using nuclear techniques to improve the fertility of the soil in Iraq and the productivity of the livestock in Libya. (App. IV provides information on the dollar amounts and types of technical assistance that IAEA provided for its members states, including the countries of concern to the United States, from 1958 through 1996.)

Although IAEA provides most of its technical assistance in areas that do not generally pose concerns about nuclear proliferation, our review of projects in countries of concern to the United States identified three cases in which IAEA provided technical assistance to countries where the United States has concerns about nuclear proliferation and threats to nuclear safety. A discussion of these three cases follows.

Bushehr Nuclear Power Plant in Iran

The United States strongly opposes the sale of any nuclear-related technology to Iran, including the sale of Russian civilian reactor technology, because the United States believes that any nuclear technology and training could help Iran advance its nuclear weapons program. At an April 1997 hearing on concerns about proliferation associated with Iran, held before the Committee on Foreign Relations, Subcommittee on Near Eastern and South Asian Affairs, the former director of the Central Intelligence Agency stated that through the operation of the Bushehr reactor, the Iranians will develop substantial expertise that will be relevant to the development of nuclear weapons.[14] For 1995 through 1999, IAEA has budgeted about $1.3 million for three ongoing technical assistance projects for the Bushehr nuclear power plant under construction in Iran. As of May 1997, about $250,000 of this amount had been spent for two of these projects. According to IAEA's project summaries for 1997 through 1998, the three projects are (1) developing a nuclear regulatory infrastructure by training personnel in nuclear safety assessment; (2) establishing an independent multipurpose center that will provide emergency response services, train nuclear regulators, and conduct accident analyses in preparation for licensing the plant; and (3) building the capability of the nuclear technology center in Iran to

[14]In 1973, a German firm began to construct two reactors in Iran near Bushehr, but the construction was halted during the Islamic Revolution in 1979. In 1995, Iran and Russia reached an $800 million agreement for the Ministry of the Russian Federation for Atomic Energy (MINATOM) to resume construction of Unit 1 of the Bushehr nuclear power plant with a Russian VVER-1000 design nuclear power reactor.

support the Bushehr plant. (See app. V for more details on the assistance IAEA is providing to Iran for the Bushehr nuclear power plant.)

IAEA also spent about $906,000 more for three recently completed technical assistance projects for the Bushehr plant in Iran.[15] According to IAEA's status reports, the objectives of these projects were (1) to increase the capacity of the Atomic Energy Organization of Iran for evaluating nuclear power plant bids and to develop a regulatory infrastructure and policy; (2) to assist in assessing the status of the Bushehr plant before construction resumed, including advising on nuclear safety criteria for licensing and assisting in developing a national infrastructure for work on the plant's construction; and (3) to assist in assembling and installing a radioactive waste incinerator for the plant. Under these projects, IAEA has sent experts on numerous missions to conduct safety reviews of the Bushehr plant and has provided equipment, such as computer systems. According to IAEA documents, IAEA believes that this assistance made a valuable contribution to the establishment of an infrastructure for Iran's nuclear power program. In addition, IAEA cited an on-site assessment of the reactor building and components by Russian contractors as a critical element in the decision to complete the plant.

We asked the State Department's Deputy Assistant Secretary for Nonproliferation for his views on the technical assistance that IAEA has provided for Iran's Bushehr nuclear power plant. According to his representative in the Bureau of Political-Military Affairs, the Special Assistant to the U.S. Representative to IAEA, the United States, as a general rule, opposes nuclear cooperation with Iran and the State Department would rather not see IAEA provide technical assistance for Iran's Bushehr nuclear power plant. The State Department official also told us that the United States had informally raised concerns to IAEA about its provision of technical assistance to the Bushehr nuclear power plant.

Uranium Prospecting and Exploration in North Korea

In March 1994, Senator Jesse Helms sent a letter to the President stating his concerns about IAEA's providing technical assistance for uranium exploration in North Korea at a time when the country was suspected of developing a nuclear weapons program.[16] According to an April 1994 letter

[15]In addition to these recently completed projects, IAEA spent about $107,000 for two other projects for the plant, completed in 1985. The objectives of these projects were to (1) train a group of Iranian engineers in quality assurance with a view to completing the Bushehr nuclear power plant and (2) assist in assessing the safety of the concrete structure of Unit 1 of the plant's reactor building. Furthermore, IAEA has funded projects for Iran in uranium prospecting and exploration.

[16]Highly enriched uranium can be used in the development of nuclear weapons.

to IAEA's Director General from the U.S. Ambassador to the U.S. Mission, IAEA's Director General had earlier assured U.S. congressional representatives that IAEA had suspended its technical assistance for North Korea because North Korea was in violation of its obligations under the NPT for failing to comply with IAEA's safeguards. The U.S. Ambassador to the U.S. Mission stated that he was unaware that several technical assistance projects for North Korea were still ongoing or had recently begun. At the June 1994 meeting of the Board of Governors, the U.S. delegation strongly recommended that IAEA's Director General suspend the provision of technical assistance to North Korea for all activities related to nuclear material, fuel cycle, and nuclear industrial applications until concerns about North Korea's compliance with IAEA's safeguards had been resolved. North Korea withdrew from IAEA in June 1994, and its technical assistance projects were canceled.

From 1987 through 1994, IAEA spent about $396,000 in technical assistance for two projects on uranium prospecting and exploration in North Korea. According to IAEA's April 1997 project status reports, the objectives of these projects were (1) to enable North Korea to better assess the potential of its nuclear raw materials in view of its increasing commitment to nuclear power and (2) to provide support for North Korea's uranium exploration program. Under the uranium prospecting project, which was completed in 1994, the status report shows that IAEA contributed a considerable amount of uranium exploration equipment to North Korea, as well as a microcomputer and software for data processing. IAEA spent more than one-third of the $87,000 budgeted for the follow-on project on uranium exploration before the project was canceled following North Korea's withdrawal from IAEA.

Nuclear Power Plant in Cuba

In March 1997, when we issued our report on IAEA's nuclear technical assistance for Cuba, including IAEA's technical assistance to the partially completed nuclear power plant, the State Department's Deputy Assistant Secretary for Nonproliferation visited IAEA's Deputy Director General for Technical Cooperation to raise concerns about IAEA's technical assistance projects for the nuclear power plant. The Deputy Assistant Secretary noted that strong U.S. support for IAEA's technical cooperation program could be endangered by perceptions that IAEA is supporting Cuban plans to build an unsafe reactor. He also told IAEA's Deputy Director General for Technical Cooperation that the United States found it hard to justify IAEA's provision of assistance to Cuba's nuclear power plant for quality assurance and licensing when, because of financial constraints, it was

unlikely that the plant would be completed. However, as of June 1997, IAEA was still conducting these two projects in licensing and quality assurance for the Cuban plant.

United States No Longer Withholds Voluntary Funds to IAEA for Countries of Concern

In our March 1997 report, we noted that, from 1981 through 1993, the United States was required, under section 307(a) of the Foreign Assistance Act of 1961 and related appropriations provisions, to withhold a proportionate share of its voluntary contribution to the technical cooperation fund for Cuba, Libya, Iran, and the Palestine Liberation Organization because the fund provided assistance to these entities. The United States withheld about 25 percent of its voluntary contribution to the fund for these entities. From 1981 through 1995, the State Department withheld a total of over $4 million. State Department officials told us they believe that the withholding was primarily a symbolic gesture that had no practical impact on the total amount of technical assistance that IAEA provided to these countries. On April 30, 1994, the Foreign Assistance Act was amended, and Myanmar (formerly Burma), Iraq, North Korea, and Syria were added to the list of entities from which U.S. funds for certain programs sponsored by international organizations were withheld. At the same time, IAEA was exempted from the withholding requirement. Consequently, as of 1994, the United States was no longer required to withhold a portion of its voluntary contribution to IAEA's technical cooperation fund for any of these entities. However, State Department officials told us that they misinterpreted the act and continued to withhold funds in 1994 and 1995. Beginning in 1996, the State Department discontinued withholding any of the U.S. voluntary contribution to the fund.[17]

Conclusions

The United States and other IAEA major donor countries have had concerns about the effectiveness and efficiency of the technical cooperation program. However, IAEA has taken steps to improve the effectiveness and efficiency of the technical cooperation program and the measurement of the program's performance. The United States and others strongly support these initiatives, but concerns remain about the sustainability of these improvements.

[17]On June 3, 1997, H.R. 1757, which authorizes appropriations for the Department of State for fiscal years 1998 and 1999, was introduced by the 105th Congress. The bill proposes, among other things, that the United States withhold a proportional share of its funds for IAEA's programs or projects in Cuba.

The United States is paying for more than its designated share of the technical cooperation fund because many member states are not paying into the fund. Yet many of these states are receiving the benefits of IAEA's technical assistance. This is contrary to the State Department's position that all IAEA member states, particularly those that receive technical assistance, should provide financial support for the program.

Although U.S. officials are sporadically reviewing technical assistance projects in countries of concern to the United States, they are neither systematically reviewing technical assistance projects before their approval nor regularly monitoring ongoing technical assistance projects. Without a systematic review, U.S. officials may be unaware of specific instances in which IAEA's assistance could raise concerns for the United States about nuclear proliferation and threats to nuclear safety. Most of the assistance that IAEA provides is not considered to be sensitive. However, in several cases, the technical assistance that IAEA has provided is contrary to U.S. policy goals. Moreover, since 1996, a portion of the U.S. funding has supported technical assistance projects that will ultimately benefit nuclear programs, training, and techniques in countries of concern to the United States, including Iran and Cuba.

Matters for Congressional Consideration

To assist the Congress in making future decisions about the continued U.S. funding of IAEA's technical cooperation program, the Congress may wish to require that the Secretary of State periodically report to it on any inconsistency between IAEA's technical assistance projects and U.S. nuclear nonproliferation and safety goals.

If the Congress wishes to make known that the United States does not support IAEA's technical assistance projects in countries of concern, as defined by section 307(a) of the Foreign Assistance Act of 1961, as amended, it could explicitly require that the State Department withhold a proportional share of its voluntary funds to IAEA that would otherwise go to these countries.

Recommendations to the Secretary of State

We recommend that the Secretary of State direct the U.S. interagency group on technical assistance, in consultation with the U.S. representative to IAEA, to systematically review all proposed technical assistance projects in countries of concern, as covered by section 307(a) of the Foreign Assistance Act of 1961, as amended, before the projects are approved by IAEA's Board of Governors, to determine whether the proposed projects are

consistent with U.S. nuclear nonproliferation and safety goals. If U.S. officials find that any projects are inconsistent with these goals, we recommend that the U.S. representative to IAEA make the U.S. objections known to IAEA and monitor the projects in these countries.

Agency Comments

We provided copies of a draft of this report to the Department of State for review and comment. The Department obtained and coordinated comments from Argonne National Laboratory; ACDA; DOE; NRC; the U.S. Mission to the United Nations System Organizations in Vienna, Austria; and IAEA. On August 1, 1997, we met with officials from the Department of State—including the Deputy Director, Office of Technical Specialized Agencies, Bureau of International Organization Affairs—and from the Department of Energy— including a Foreign Affairs Specialist in the Office of Nonproliferation and National Security. The agencies provided clarifying information and technical corrections, which we incorporated into the report.

The agencies generally agreed with the facts as presented in the report and made no comments on our recommendations. They did, however, express one concern about our matters for congressional consideration. Specifically, they suggested that withholding a part of the U.S. voluntary contribution to IAEA that is proportional to all of the assistance that IAEA provides to Cuba, North Korea, and other countries of concern would be seen as a politicization of the technical assistance process that could undercut U.S. nonproliferation objectives. The agencies added that they do not object to IAEA's providing technical assistance to countries of concern in the areas of nuclear safety, medicine and agriculture. We cannot speculate on how others might view such a withholding requirement. However, as discussed in the report, the United States did, from 1981 through 1995, withhold a portion of its voluntary contribution to IAEA, amounting to over $4 million, for technical assistance for countries of concern to the United States. IAEA was exempted from the withholding requirement in 1994, although the State Department continued to withhold funds in 1994 and 1995. Our report also notes the recent introduction into the Congress of a bill proposing that the United States withhold a proportional share of its funds for IAEA's programs or projects in Cuba.

In addition, the agencies said that IAEA's technical cooperation program, in general, has strongly supported U.S. nuclear safety policy objectives, most notably in Central and Eastern Europe and in the Newly Independent States that operate unsafe Soviet-designed reactors. The agencies further

observed that the United States continues to support IAEA's nuclear safety efforts. In appendix IV, we acknowledge IAEA's contribution to nuclear safety, noting that from 1958 through 1996, IAEA spent about 16 percent of its technical assistance on safety in nuclear energy.

Scope and Methodology

We discussed U.S. participation in IAEA's technical cooperation program with officials of and gathered data from the Department of State; DOE; ACDA; NRC; Argonne National Laboratory; and the National Academy of Sciences/National Research Council in Washington, D.C., as well as from the U.S. Mission to the United Nations System Organizations and IAEA in Vienna, Austria. We met with IAEA's Director General; Deputy Directors General for Administration, Research and Isotopes, Nuclear Energy, Nuclear Safety, and Technical Cooperation; the Principal Officer for the Deputy Director General for Safeguards; a Senior Legal Officer in the Department of Administration; and other staff.

We reviewed program files at the Department of State and at the U.S. Mission to the United Nations System Organizations in Vienna, Austria. We gathered financial and programmatic data from IAEA on its technical cooperation for the period from 1958, when the program began, until 1996. Programmatic data for the entire period were not always available from IAEA. We did not independently verify the quality and accuracy of IAEA's data.

We also met in Vienna, Austria, with representatives from four of the member states that are major financial donors to the technical cooperation program and six of the states that receive extensive technical assistance or represent the views of the developing countries. The four major donors were Japan, Australia, Canada, and Germany; the six major recipient and/or developing countries were Argentina, Brazil, China, India, Pakistan, and South Africa.

We also reviewed 40 reports on various aspects of the technical cooperation program that were prepared by IAEA's Department of Technical Cooperation's Evaluation Section; summaries of four audits of the program prepared by IAEA's Office of Internal Audit and Evaluation Support that covered the period from 1985 through 1996; and four project files for selected technical assistance projects in Iran, North Korea, Bulgaria, and Egypt that were completed or canceled. We reviewed IAEA's data on the technical assistance projects provided for countries of concern to the United States to determine whether IAEA's assistance conflicted with

U.S. nuclear nonproliferation and safety goals. We observed two meetings of the International Nuclear Technology Liaison Office (the U.S. interagency group that coordinates U.S. participation in IAEA's technical cooperation program), the November 1996 meeting of the Technical Assistance and Cooperation Committee, and the December 1996 meeting of IAEA's Board of Governors in Vienna, Austria.

We performed our work from July 1996 through August 1997 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Secretaries of State and Energy, the Chairman of the Nuclear Regulatory Commission, the Director of the Arms Control and Disarmament Agency, and other interested parties. We will also make copies available to others on request. Please call me at (202) 512-3841 if you or your staff have any questions. Major contributors to this report are listed in appendix VI.

Victor S. Rezendes
Director, Energy, Resources,
and Science Issues

Contents

Abbreviations

ACDA	Arms Control and Disarmament Agency
DOE	Department of Energy
IAEA	International Atomic Energy Agency
MINATOM	Ministry of the Russian Federation for Atomic Energy
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NRC	Nuclear Regulatory Commission
UNDP	United Nations Development Program

Improving the Effectiveness and Efficiency of IAEA's Technical Cooperation Program

In 1992, the International Atomic Energy Agency's (IAEA) Deputy Director General for Technical Cooperation embarked on a series of improvements so that the technical cooperation program would better meet the needs of its recipients and its impact would be measurable. The United States and other IAEA member states strongly support the Deputy Director General's efforts to improve the program.

IAEA Has Initiated Efforts to Improve the Program

When IAEA's current Deputy Director General for Technical Cooperation began his term in 1992, he established a new strategy for improving the effectiveness and efficiency of the program. According to an IAEA paper, the goal of the new strategy is to develop partnerships between IAEA and its member states so that technical assistance produces a "measurable socio-economic impact by directly contributing in a cost-efficient manner to the achievement of the highest development priority of the [recipient] country." Important components of the strategy are "model" projects that are expected to

- respond to a real need of the recipient country,
- produce a significant economic or social impact by looking beyond the immediate recipient of assistance to the final end user,
- demonstrate sustainability after the project's completion through a strong government commitment,
- require detailed workplans and objective performance indicators, and
- demonstrate an indispensable role for nuclear technology with distinct advantages over other approaches.

Since 1994, IAEA has initiated nearly 60 model projects, including those under the 1997-98 technical cooperation program. Few model projects have been completed, so it is too early to assess their impact. Nevertheless, some of the model projects that IAEA expects will have measurable results include

- using a radioimmunoassay to screen for thyroid deficiency in newborn children in Tunisia,
- providing nuclear methods to evaluate the effectiveness of a government food supplement intervention program to combat malnutrition in Peru,
- supporting a program for using nuclear techniques to improve local varieties of sorghum and rice in Mali, and
- eliminating the tsetse fly from the island of Zanzibar using radiation to sterilize male flies.

IAEA is also working to design model projects within a "country program framework." The goal of this framework is to achieve agreement between IAEA and the recipient country on concentrating technical cooperation on a few high-priority areas where projects produce a significant national impact. IAEA expects to have concluded the frameworks with one-half of the recipients of technical assistance by the year 2000.

United States Supports IAEA's Efforts to Improve the Program

Like most other IAEA member countries, the United States supports the efforts of IAEA's Deputy Director General for Technical Cooperation to improve the effectiveness and efficiency of the technical cooperation program. U.S. officials believe that the initiatives and strategic goals of the Technical Cooperation Department and IAEA are extremely significant, particularly now that donor countries' resources may be declining and the effectiveness and efficiency of all international organizations are being questioned. Since these reform efforts began, the United States has been a strong supporter of the program, making experts available to IAEA, funding specific model projects, and supporting the program in statements before IAEA's Board of Governors.

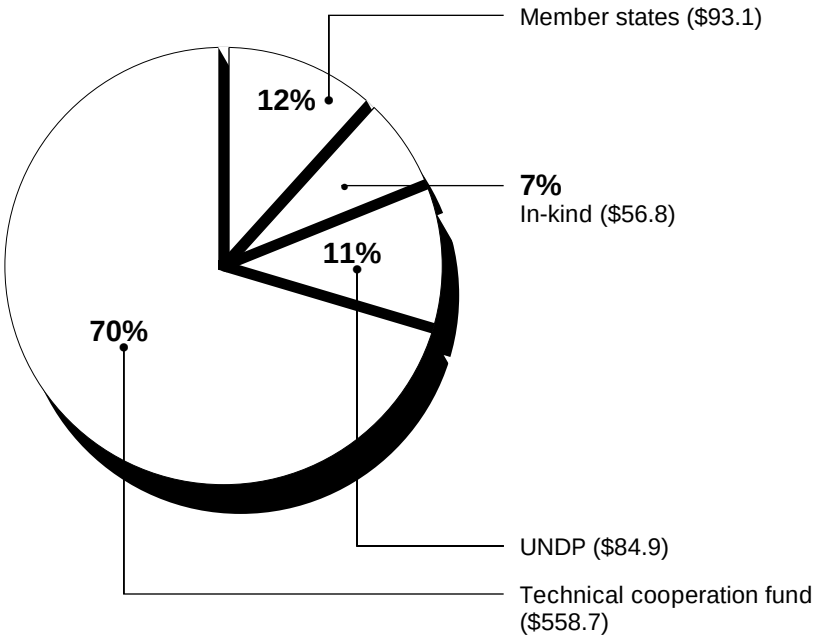
Although the United States, with other IAEA major donor countries, supports efforts to improve the technical cooperation program, it also shares some concerns with the other major donors about the sustainability of these improvements. State Department officials, including U.S. Mission officials, believe that IAEA must focus on implementation if the efforts at improvement are to last beyond the tenure of the current Deputy Director General, which ends in 1999. According to State Department officials, there is a difference between initiating change and achieving permanent change. These officials have insisted that the Department of Technical Cooperation provide IAEA's Board of Governors with a strategic plan that will lead to permanent change.

Sources of Funding for IAEA's Technical Cooperation Program From 1958 Through 1996

Within IAEA, the Department of Technical Cooperation and three other technical departments—the departments of Research and Isotopes, Nuclear Safety, and Nuclear Energy—are the main channels for technology transfer activities within the technical cooperation program. IAEA receives funding for the costs of administration and related support in the Department of Technical Cooperation and for activities in the three technical departments through IAEA's regular budget. However, most of the funding for IAEA's technical assistance—about 70 percent—comes from voluntary contributions made by the member states to IAEA's technical cooperation fund, as figure II.1 shows. In addition to the technical cooperation fund, other sources of voluntary financial support for the program include the following:

- Extrabudgetary cash contributions are made by member states for specific technical assistance projects—known as "footnote a" projects—and for training. Although "footnote a" projects are considered to be technically sound by IAEA, they are of lower priority to recipient member states than the projects that are financed through the technical cooperation fund. The United States endeavors to provide support for "footnote a" projects in countries that are parties to nonproliferation treaties.
- Assistance in kind includes equipment donated by member states, expert services, or fellowships arranged on a cost-free basis.
- The United Nations Development Program (UNDP) provide funds through IAEA for its development projects that IAEA implements in areas involving nuclear science and technology.

Figure II.1: Primary Sources of Funding for IAEA's Technical Cooperation Program, 1958-96, Dollars in Millions



Note: Figures in parentheses have been rounded and do not include funds from IAEA's regular budget that are used to provide administration and support for technical assistance.

Source: IAEA.

IAEA Member States' Contributions to the 1996 Technical Cooperation Fund

For calendar year 1996, fewer than half of the 124 IAEA member states contributed to the technical cooperation fund. As table III.1 indicates, 52 states contributed a total of about $48.6 million. Of these states, the United States and Japan contributed the most, accounting for over half of the total payments to the fund. Twenty-four member states that contributed to the fund also received about $22.5 million in technical assistance from IAEA.

Table III.1: IAEA Member States That Contributed to the 1996 Technical Cooperation Fund, Ranked by the Amount Paid as a Percentage of Total Contributions, as of August 1997

Member state	Designated percentage of $64.5 million fund target	Amount paid to fund	Actual percentage of total payments
United States	25.00	$15,723,000[a]	32.4
Japan	13.97	9,010,650	18.60
Germany	8.96	4,579,200	9.40
France	6.33	4,082,850	8.40
United Kingdom	5.28	3,405,600	7.00
Canada	3.08	1,914,077	4.00
Netherlands	1.58	1,019,100	2.10
Australia	1.47	969,925	2.00
Sweden	1.22	786,900	1.60
Switzerland	1.21	780,450	1.60
Austria	0.85	548,250	1.10
Mexico	0.78	503,100	1.00
China	0.72	464,400	1.00
Denmark	0.70	451,500	0.90
Finland	0.61	393,450	0.80
Spain	2.25	355,155	0.70
Norway	0.55	354,750	0.70
Korea, Republic of	0.80	350,000	0.70
Argentina	0.48	310,000	0.60
Poland	0.38	245,100	0.50
Turkey	0.34	219,300	0.50
Czech Republic	0.32	206,400	0.40
India	0.31	199,950	0.40
Iran	0.60	190,000	0.40
Brazil	1.62	151,028	0.30
South Africa	0.34	109,650	0.20
Israel	0.26	100,000	0.20
Hungary	0.15	96,750	0.20

(continued)

Member state	Designated percentage of $64.5 million fund target	Amount paid to fund	Actual percentage of total payments
Romania	0.15	96,750	0.20
Malaysia	0.14	90,300	0.20
Thailand	013	83,850	0.20
Portugal	0.20	69,900	0.10
Indonesia	0.14	70,000	0.10
Slovakia	0.10	64,500	0.10
Colombia	0.11	60,000	0.10
Egypt	0.07	50,445	0.10
Algeria	0.16	50,000	0.10
Ireland	0.20	50,000	0.10
Slovenia	0.07	48,762	0.10
Cuba	0.07	45,150	0.10
Pakistan	0.06	38,700	0.10
Philippines	0.06	38,700	0.10
Morocco	0.03	20,000	0.04
Iceland	0.03	19,350	0.04
Bulgaria	0.10	10,000	0.02
Bangladesh	0.01	6,450	0.01
Lebanon	0.01	6,450	0.01
Liechtenstein	0.01	6,450	0.01
Vietnam	0.01	6,450	0.01
Sri Lanka	0.01	5,000	0.01
Syria	0.05	4,000	0.01
Total		**$48,579,932**	

[a]In addition, the United States paid $402,000 in fiscal year 1995 that was credited to fiscal year 1996.

Source: IAEA.

In 1996, 72, or about 58 percent, of the 124 IAEA member states did not contribute to the technical cooperation fund. Fifty-seven of these states received a total of $26,039,722 in technical assistance from IAEA, as table III.2 indicates.

Table III.2: IAEA Member States That Did Not Contribute to the 1996 Technical Cooperation Fund, Ranked by the Amount of Assistance Received in 1996, as of August 1997

Member state	Amount of technical assistance received in 1996
Tanzania	$2,020,700
Ghana	1,508,200
Nigeria	1,342,100
Peru	1,222,200
Mongolia	962,400
Chile	946,900
Sudan	935,200
Myanmar (Burma)	922,700
Ukraine	906,600
Bolivia	771,300
Albania	695,900
El Salvador	683,000
Armenia	667,000
Ethiopia	635,000
Uruguay	633,900
Uganda	615,600
Costa Rica	593,100
Venezuela	578,300
Jordan	573,000
Namibia	570,300
Zambia	492,600
Kenya	466,700
Tunisia	442,300
Guatemala	437,000
Dominican Republic	433,100
Nicaragua	398,500
Zimbabwe	371,000
Kazakstan	368,000
Sierra Leone	366,100
Niger	354,100
Belarus	339,400
Mali	326,300
Cameroon	323,700
Iraq	300,200
Madagascar	288,600
Macedonia	279,400
Mauritius	235,700

(continued)

Member state	Amount of technical assistance received in 1996
Croatia	234,400
Ecuador	231,500
Cote d'Ivoire	222,000
Panama	214,100
Libya	200,600
Uzbekistan	158,600
Cyprus	148,900
Paraguay	129,900
Senegal	126,800
Saudi Arabia	117,400
Zaire	97,400
United Arab Emirates	90,000
Bosnia and Herzegovina	88,500
Estonia	77,800
Lithuania	57,000
Jamaica	31,900
Marshall Islands	8,600
Haiti	8,200
Liberia	6,300
Kuwait	5,500
Afghanistan	0
Belgium	0
Cambodia	0
Gabon	0
Georgia	0
Holy See	0
Italy	0
Luxembourg	0
Monaco	0
New Zealand	0
Qatar	0
Russian Federation	0
Singapore	0
Yemen	0
Yugoslavia	0
Total	**$26,039,722**

(Table notes on next page)

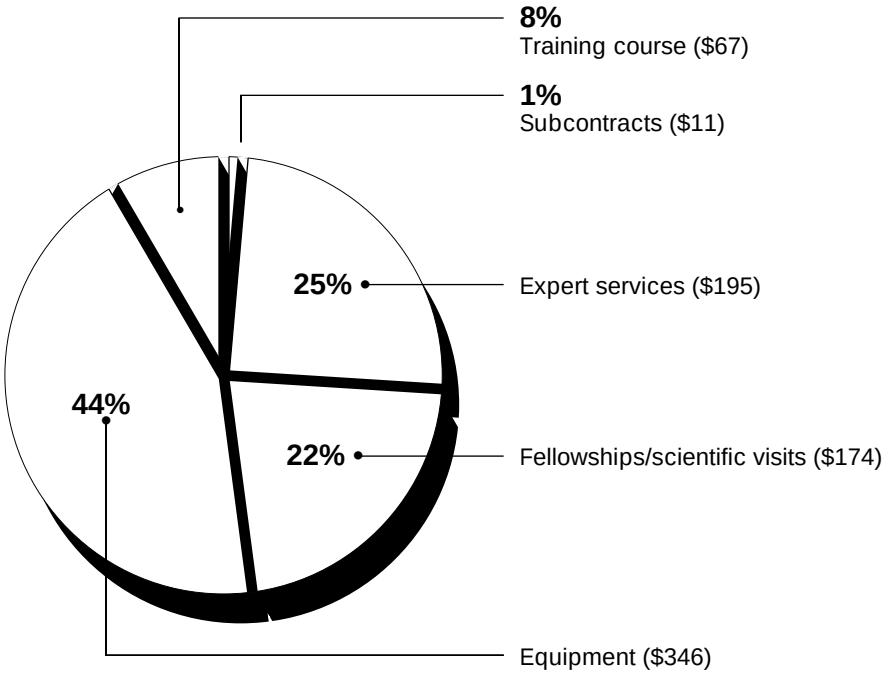
Note: Technical assistance includes funds from the technical cooperation fund, extrabudgetary contributions from member states, assistance in kind, and UNDP funds.

Source: IAEA.

Dollar Amount and Type of Technical Assistance IAEA Provided for Its Member States, Including Countries of Concern, From 1958 Through 1996

IAEA spent about $800 million on technical assistance for its member states from 1958—when the technical cooperation program began—through 1996, for equipment, expert services, training, and subcontracts. Figure IV.1 shows that about 44 percent of the funds were spent for equipment, such as computer systems and radiation-monitoring and laboratory equipment. In 1996, the United States was the largest single supplier of equipment for IAEA's technical cooperation program.

Figure IV.1: Dollar Amount and Type of Technical Assistance That IAEA Provided for Its Member States, 1958-96 Dollars in Millions



Note: Figures in parentheses have been rounded.

Source: IAEA.

Major Recipients of IAEA's Technical Assistance

Of the more than 120 IAEA member states that received IAEA's technical assistance from 1958 through 1996, 10 states received more than 20 percent of the $800 million given, or about $175.7 million collectively, as table IV.1 indicates. Egypt, which started to receive technical assistance from IAEA in 1970, has received the largest total amount.

Table IV.1: Major Recipients of IAEA's Technical Assistance, 1958-96

Dollars in millions

Rank	Recipient country	Amount of technical assistance received	Percentage of total assistance provided	First year assistance was received
1	Egypt	$27.5	3.5	1970
2	Brazil	21.3	2.7	1959
3	Indonesia	18.6	2.3	1959
4	Thailand	18.5	2.3	1959
5	Peru	16.1	2.0	1960
6	Pakistan	15.6	2.0	1959
7	Philippines	15.0	1.9	1959
8	China	14.7	1.9	1959
9	Poland	14.4	1.8	1959
10	Bangladesh	14.0	1.8	1972
	Total	**$175.7**	**22.1**	

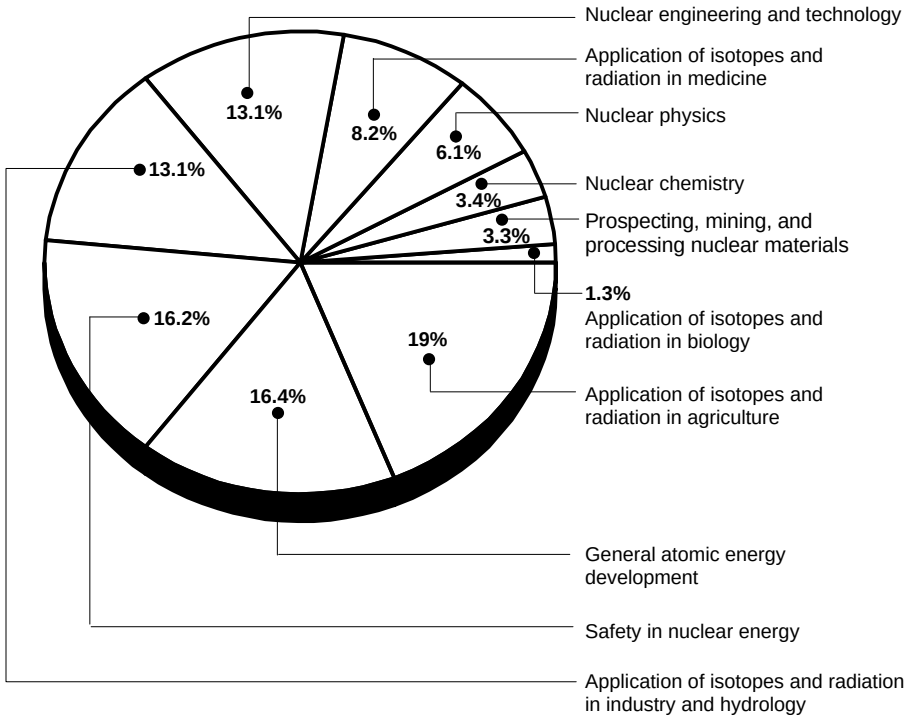
Source: IAEA.

IAEA's Technical Assistance, by Program Area

About half—or $334 million—of the $648 million that IAEA spent for technical assistance from 1980 through 1996 was provided for three program areas—the application of isotopes and radiation in agriculture, general atomic energy development, and safety in nuclear energy—as figure IV.2 shows.[18] Moreover, two other program areas—nuclear engineering and technology, and the application of isotopes and radiation in industry and hydrology—received about 26 percent of the funds, for a total of about $169 million. IAEA approved about $154 million more in technical assistance projects for its member states for 1997 through 1998. Over half of this additional assistance will be provided for the application of isotopes and radiation in medicine, agriculture, and safety in nuclear energy.

[18]IAEA was not able to provide us with data for years prior to 1980.

Figure IV.2: Technical Assistance Provided by IAEA for Its Member States, by Program Area, 1980-96



Note: Percentages do not total 100 because of rounding.

Source: IAEA.

Dollar Amount and Type of IAEA's Technical Assistance for Countries of Concern

Of the about $800 million in technical assistance provided by IAEA to all of its member states from 1958 through 1996, about $52 million was spent on countries currently of concern to the United States. As table IV.2 indicates, most assistance given to these countries was in the form of equipment.

Table IV.2: Amount and Type of IAEA's Technical Assistance for Countries Currently of Concern to the United States, 1958-96

Dollars in thousands

Country of concern	Rank in terms of technical assistance received	First year technical assistance was received	Type of technical assistance				
			Expert services	Equipment	Fellowships and scientific visits	Subcontracts[a]	Total
Iran	19	1959	$2,950	$6,006	$2,839	$212	$12,007
Cuba	21	1963	1,248	8,718	1,915	113	11,994
Syria	31	1968	1,385	5,078	1,556	256	8,275
North Korea	36	1978	494	5,142	1,033	0	6,669
Myanmar	43	1959	1,505	2,806	1,056	0	5,368
Libya	51	1970	1,190	1,441	1,652	0	4,283
Iraq	55	1960	912	1,381	1,089	18	3,400
Total			**$9,684**	**$30,572**	**$11,141**	**$599**	**$51,996**

[a]Agreements between IAEA and a third party to provide services to member states.

Source: IAEA.

IAEA's Active Technical Assistance Projects for the Bushehr Nuclear Power Plant in Iran

In 1973, a German firm began the construction of two reactors in Iran near Bushehr, but construction was halted during the Islamic Revolution in 1979. In 1995, Iran and Russia reached an $800 million agreement for the Ministry of the Russian Federation for Atomic Energy (MINATOM) to resume the construction of Unit 1 of the Bushehr nuclear power plant and to switch from a German-designed to a Russian-designed VVER-1000 model reactor. According to IAEA's project summaries for the proposed 1997-98 program, the decision to resume the Bushehr project with a new design has placed heavy responsibility on Iran's Nuclear Safety Department, the regulatory body of the Atomic Energy Organization of Iran.

For 1995 through 1999, IAEA budgeted about $1.3 million for three ongoing technical assistance projects for the Bushehr nuclear power plant under construction in Iran. As of May 1997, about $250,000 of this amount had been spent for two of these projects. According to IAEA's project summaries for 1997-98, the three projects are (1) developing a nuclear regulatory infrastructure by training personnel in nuclear safety assessment; (2) establishing an independent multipurpose center that will provide emergency response services, train nuclear regulators, and analyze accidents in preparation for licensing the plant; and (3) building the capability of the Esfahan Nuclear Technology Center in Iran to support the Bushehr plant.

Infrastructure for Implementation of Bushehr Nuclear Power Plant Program Project

This ongoing project was originally approved in 1995 and is partly a continuation of another project—completed in 1995 for about $77,000—to increase the capability of staff at the Atomic Energy Organization of Iran to evaluate nuclear power plant bids and to develop a regulatory infrastructure and policy. The aim of the ongoing project is to develop a nuclear regulatory infrastructure by training personnel in nuclear safety assessment and in operator responsibilities. Under the project, IAEA has sent experts on numerous missions to Iran to provide advice and training in quality assurance, project management, and site and safety reviews; has provided supplies such as books and journals; and has sponsored some fellowships and scientific visits. A workshop for the top management of Iran's atomic energy authority was held on quality assurance in 1995. Eight reports have been prepared under the project by experts on topics such as quality assurance, a preliminary safety review of the plant, and a review of seismic hazard studies at the plant site. As of May 1997, IAEA had spent about $241,000 for expert services, equipment (supplies), and fellowships—or about half of the approximately $494,000 that it plans to spend through 1998, as indicated in table V.1.

Table V.1: Expenditures for Infrastructure for Implementation of Bushehr Nuclear Power Program Project, 1995-97

Year	Expert services	Equipment	Fellowships	Total
1995	$99,546	$1,126	0	$100,673
1996	99,269	490	$5,225	104,985
1997	34,108	0	2,015	36,123
Total	**$232,924**	**$1,617**	**$7,240**	**$241,781**

Note: Expenditure data are as of May 1997.

Source: IAEA.

Regulatory Infrastructure for Licensing of Bushehr Nuclear Power Plant Project

This new model project, which was approved under IAEA's 1997-98 technical cooperation program, is intended to improve the overall safety of the plant by establishing an independent multipurpose center that will provide emergency response services, train regulators, and analyze accidents. IAEA will furnish experts to advise, assist, and provide training in the following areas: (1) identify safety features and evaluate them in the context of the VVER-1000 design for formulating the regulatory requirements; (2) formulate a safety policy and associated licensing and supervisory procedures for the completion of the plant; (3) train regulatory staff; (4) evaluate submitted regulatory documents; and (5) establish a national regulatory inspectorate to carry out inspections during the design, construction, commissioning, and operation of the plant. IAEA has already sent a number of experts on missions to Iran as a part of the project. IAEA expects that the project will help the national regulatory body to discharge its statutory responsibilities for ensuring that the plant is constructed according to regulatory standards conducive to safe operation. As of May 1997, IAEA had provided approximately $8,440 in expert services and was planning to provide a total of approximately $403,000 for expert services and fellowships though 1999.

Strengthening Reactor Technology for Bushehr Nuclear Power Plant Project

Another new project for the plant, which was approved under IAEA's 1997-98 technical cooperation program, will enhance the ability of Iran's Esfahan Nuclear Technology Center to support the Bushehr plant. IAEA's project summary states that while Iran's nuclear technology center has adequate technical and scientific expertise on nuclear safety and quality assurance to support Iran's nuclear regulatory body and the plant, the center has asked for IAEA's expert advice and transfer of up-to-date knowledge. IAEA will provide expert services to help the center analyze the capabilities of the power plant and will provide training in reactor safety

analysis and reactor technology. According to the project summary, this project will develop expertise at the center in safety analysis and other technical expertise for the Bushehr plant. IAEA plans to provide a total of $400,800 for expert services and fellowships for the project by 1999.

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