

**GAO**

Report to the Chairman, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

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March 2009

# NUCLEAR NONPROLIFERATION

## Strengthened Oversight Needed to Address Proliferation and Management Challenges in IAEA's Technical Cooperation Program



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Highlights of [GAO-09-275](#), a report to the Chairman, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

## Why GAO Did This Study

A key mission of the International Atomic Energy Agency (IAEA) is promoting the peaceful uses of nuclear energy through its Technical Cooperation (TC) program, which provides equipment, training, fellowships, and other services to its member states. The United States provides approximately 25 percent of the TC program's annual budget. This report addresses the (1) extent to which the United States and IAEA have policies limiting member states' participation in the TC program on the basis of nuclear proliferation and related concerns; (2) extent to which the United States and IAEA evaluate and monitor TC projects for proliferation concerns; and (3) any limitations and challenges in IAEA's management of the TC program. To address these issues, GAO interviewed relevant officials at the Departments of State (State) and Energy (DOE) and IAEA; analyzed IAEA, DOE, and national laboratory data; and assessed State and IAEA policies toward the TC program.

## What GAO Recommends

GAO is asking Congress to consider requiring State to withhold a proportionate share of its contributions to the TCF for TC program assistance provided to U.S.-designated state sponsors of terrorism or to report to Congress on its rationale for not withholding a proportionate share of its TCF contribution for such countries. State opposed a proportionate withholding requirement. State agreed with the majority of GAO's other recommendations.

To view the full product, including the scope and methodology, click on [GAO-09-275](#). For more information, contact Gene Aloise at (202) 512-3841 or [aloise@gao.gov](mailto:aloise@gao.gov).

## NUCLEAR NONPROLIFERATION

### Strengthened Oversight Needed to Address Proliferation and Management Challenges in IAEA's Technical Cooperation Program

#### What GAO Found

Neither State nor IAEA seeks to systematically limit TC assistance to countries the United States has designated as state sponsors of terrorism—Cuba, Iran, Sudan, and Syria—even though under U.S. law these countries are subject to sanctions. Together, these four countries received more than \$55 million in TC assistance from 1997 through 2007. In addition, TC funding has been provided to states that are not party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)—India, Israel, and Pakistan—and neither the United States nor IAEA has sought to exclude these countries from participating in the TC program. Finally, IAEA member states are not required to complete comprehensive safeguards or additional protocol agreements with IAEA—which allow IAEA to monitor declared nuclear activities and detect clandestine nuclear programs—to be eligible for TC assistance, even though U.S. and IAEA officials have stressed the need for all countries to bring such arrangements into force as soon as possible.

The proliferation concerns associated with the TC program are difficult for the United States to fully identify, assess, and resolve for several reasons. While State has implemented an interagency process to review proposed TC projects for proliferation risks, the effectiveness of these reviews is limited because IAEA does not provide the United States with sufficient or timely information on TC proposals. Of the 1,565 TC proposals reviewed by DOE and the U.S. national laboratories for possible proliferation risks from 1998 through 2006, information for 1,519 proposals, or 97 percent, consisted of only project titles.

IAEA faces several limitations and challenges in effectively managing the TC program. First, the TC program's impact in meeting development and other needs of member states is unclear because IAEA has not updated and revised the program's performance metrics since 2002. Second, the TC program is limited by financial constraints, including the failure of many member states to pay their full share of support to the program's Technical Cooperation Fund (TCF). In 2007, the TCF experienced a shortfall of \$3.5 million, or 4 percent, of the \$80 million total target budget, because 62 member states did not pay their full expected contributions, including 47 states that made no payment at all. Furthermore, IAEA has not developed a policy for determining when countries should be graduated from receiving TC assistance, including those defined by the UN as high-income countries. Finally, the TC program's long-term viability is uncertain because of limitations in IAEA efforts to track how project results are sustained and because of shortcomings in strategies to develop new TC program partners and donors.

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## Abbreviations

DOE	Department of Energy
FAO	Food and Agriculture Organization
IAEA	International Atomic Energy Agency
LANL	Los Alamos National Laboratory
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
ORNL	Oak Ridge National Laboratory
State	Department of State
TC	Technical Cooperation
TCF	Technical Cooperation Fund
UN	United Nations
U.S. Mission	U.S. Mission to International Organizations in Vienna
WMD	weapons of mass destruction

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United States Government Accountability Office  
Washington, DC 20548

March 5, 2009

The Honorable Daniel K. Akaka  
Chairman  
Subcommittee on Oversight of Government  
Management, the Federal Workforce,  
and the District of Columbia  
Committee on Homeland Security and  
Governmental Affairs  
United States Senate

Dear Mr. Chairman:

The International Atomic Energy Agency (IAEA), an independent international organization based in Vienna, Austria, that is affiliated with the United Nations (UN), has the dual mission of promoting the peaceful uses of nuclear energy and verifying that nuclear technologies and materials intended for peaceful purposes are not diverted to weapons development efforts. IAEA promotes peaceful uses of nuclear energy through its Technical Cooperation (TC) program, to support the development of nuclear power, applications in human health, food and agriculture, and nuclear safety, among other areas. All 145 IAEA member states are eligible for TC assistance; however, not all countries request assistance. The United States participates as a donor and is the largest financial contributor to the TC program, providing approximately 25 percent of its budget, or about \$19.8 million, in 2007.

The TC program's mission is to help IAEA member states achieve their sustainable development priorities by furnishing them with relevant nuclear technologies and expertise. This mission is derived from Articles II and III of IAEA's statute. IAEA provides TC support to member states through individual projects, which may be implemented on a national, regional, or interregional basis. A few nonmember states receive assistance under some regional TC projects.

The TC program also plays a role in facilitating Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which affirms that all states party to the treaty have a right to participate in the exchange of equipment, materials, and scientific and technological information for peaceful uses of nuclear energy. The NPT also requires nonnuclear weapon state parties to the NPT (defined as those countries that had not manufactured and detonated a nuclear device before January 1, 1967) to

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accept IAEA safeguards on all nuclear material used in peaceful activities so that the agency can verify that their nuclear programs are not being used for weapons purposes.<sup>1</sup> Most countries have concluded “comprehensive safeguards agreements” with IAEA, under which governments declare their nuclear materials and activities to IAEA. The agency then verifies and monitors these declarations. IAEA has sought to further strengthen its verification efforts through a complementary “additional protocol” to a country’s comprehensive safeguards agreement. Under such protocols, states must provide IAEA with broader information and wider access rights on all aspects of their activities related to the nuclear fuel cycle.<sup>2</sup>

In 2007, the TC program disbursed over \$93 million in nuclear technical assistance to 122 countries and territories. TC projects have supported efforts to eradicate tsetse flies and other insect pests in certain regions, control communicable diseases in developing countries, and develop higher-yielding agricultural crops. As of June 2008, 1,290 TC projects were under way, with each project lasting, on average, 3 to 4 years. A TC project typically has several components, including equipment procurement, provision of expert services, training, and fellowships. Each year, about 1,600 individuals around the world are granted fellowships by the TC program, allowing them to pursue specialized nuclear studies at universities, institutes, and other facilities outside their home countries.<sup>3</sup>

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<sup>1</sup>The five nuclear weapons states that are party to the NPT—China, France, the Russian Federation, the United Kingdom, and the United States—are not obligated under the treaty to accept safeguards, although each nation has completed voluntary agreements with IAEA that allow varying degrees of verification at specifically designated facilities. Other countries that have not joined the NPT—India, Israel, and Pakistan—also do not have comprehensive safeguards agreements with IAEA but do have limited safeguards arrangements with IAEA on some of their specific nuclear facilities and material stockpiles.

<sup>2</sup>For more information, see GAO, *Nuclear Nonproliferation: IAEA Has Strengthened Its Safeguards and Nuclear Security Programs, but Weaknesses Need to Be Addressed*, [GAO-06-93](#) (Washington, D.C.: Oct. 7, 2005).

<sup>3</sup>TC fellowships in the United States may be funded entirely by the TC program (referred to as Type I fellowships) or from U.S. funds (referred to as Type II fellowships) to reduce or eliminate the cost to IAEA. In addition to fellowships, the TC program also supports “scientific visits,” which are shorter-term scholarships awarded to senior scientists, heads of research groups, and directors of research centers, allowing them to visit foreign nuclear institutes, observe nuclear research, and make professional contacts with other nuclear scientists and experts.

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All TC projects are considered by the Technical Assistance and Cooperation Committee of IAEA's Board of Governors—the 35-member policy-making body for IAEA programs—before they are approved by the Board of Governors. This approval covers the entire life cycle of the project. The TC Department and other departments within IAEA's Secretariat begin working with the member states to develop project concepts and proposals approximately 1 year before the project is approved.<sup>4</sup>

Financing of TC projects is generally supported through the annual voluntary contributions of member states to IAEA's Technical Cooperation Fund (TCF).<sup>5</sup> Each member state is expected to meet an annual financial pledge to the TCF, which is set as a percentage of the total fund's target budget. The U.S. target rate has been set at 25 percent, while many of the least developed countries are expected to contribute less than 1 percent of the TCF budget. Contributions to the TCF are fungible—that is, they are not designated for, and cannot be traced to, specific TC projects.

In the United States, the two principal agencies involved in TC issues are the Departments of State (State) and Energy (DOE). U.S. funding to the TC program—including its contribution to the TCF, extrabudgetary funding for specific projects, and “in-kind” contributions<sup>6</sup>—is provided from State's budget as part of the overall annual U.S. “voluntary contribution” to IAEA.<sup>7</sup> In addition to providing funding to IAEA, State coordinates U.S. policy toward the TC program by working through the U.S. Mission to International Organizations in Vienna (U.S. Mission).

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<sup>4</sup>The other IAEA departments are the Departments of Management, Nuclear Sciences and Applications, Safeguards, Nuclear Energy, and Nuclear Safety and Security.

<sup>5</sup>A TC project may be funded in whole or in part from the TCF. Projects that IAEA approves but that cannot be supported by available TCF resources are referred to as “footnote a” projects and can be supported through extrabudgetary funding provided by member states or international organizations. Extrabudgetary funding can be allocated directly to specific footnote a/ projects.

<sup>6</sup>In-kind is defined by IAEA as “gifts” of services, equipment and facilities made available to IAEA by member states or other donors, such as providing experts and training course lecturers, sponsoring training courses, donating equipment, and sponsoring certain types of fellowships.

<sup>7</sup>The U.S. voluntary contribution to IAEA also supports other IAEA programs and activities, including safeguards, nuclear safety, and nuclear security.



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We reviewed the TC program in 1997 and found that while the vast majority of TC projects did not involve the transfer of sensitive nuclear materials and technologies, nuclear assistance was provided to countries that posed a proliferation risk.<sup>8</sup> Proliferation concerns about the TC program have persisted because of the assistance it has provided to certain countries and because nuclear equipment, technology, and expertise can be dual-use—capable of serving peaceful purposes, such as the production of medical isotopes, but also useful in contributing to nuclear weapons development. For example, in 2006, IAEA refused to support a TC proposal from Iran requesting assistance for a heavy water reactor near the town of Arak. Iran stated that the reactor was intended for the production of medical isotopes. The United States and other IAEA members objected due to concerns that the plant could serve as a source of plutonium for use in nuclear weapons.

In our 1997 report, we recommended that the Secretary of State direct the U.S. interagency group on IAEA technical assistance to systematically review all proposals for TC projects in countries of concern prior to their approval by IAEA to determine whether the projects are consistent with U.S. nuclear nonproliferation goals. In response, an interagency process was established, involving State, DOE, and the DOE national laboratories,<sup>9</sup> to evaluate proposed and active TC projects for proliferation risks. State leads the reviews of TC project proposals and ongoing projects. DOE provides technical input to this process using the technical expertise of the national laboratories to assess the projects' proliferation risks and reports its findings to State.

As agreed with your office, this report assesses the (1) extent to which the United States and IAEA have policies limiting member states' participation in the TC program on the basis of nuclear proliferation and related concerns; (2) extent to which the United States and IAEA evaluate and monitor TC projects for proliferation concerns; and (3) any limitations and challenges in IAEA's management of the TC program.

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<sup>8</sup>See GAO, *Nuclear Nonproliferation and Safety: Concerns With the International Atomic Energy Agency's Technical Cooperation Program*, [GAO/RCED-97-192](#) (Washington, D.C.: Sept. 16, 1997).

<sup>9</sup>DOE manages the largest laboratory system of its kind in the world. Originally created to design and build atomic weapons, DOE's 22 laboratories have expanded their missions to conduct research in many disciplines—from high-energy physics to advanced computing.

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The scope of our review covered the period from 1997 through 2007 because our previous report on the TC program analyzed programmatic and financial data through 1996. To address these objectives, we interviewed key U.S. officials at State, DOE, and the U.S. Mission and analyzed documentation, such as cables, reports and analyses of the TC program, financial information, and statements and speeches by U.S. officials. We interviewed other individuals in the United States involved in TC program issues, including U.S. national laboratory representatives involved in conducting proliferation risk assessments of TC projects and proposals; Argonne National Laboratory staff who support State's oversight of the TC program and facilitate TC training and fellowship programs in the United States; and the U.S. representative to IAEA's Standing Advisory Group on Technical Assistance and Cooperation.

We also interviewed officials at IAEA headquarters in Vienna, Austria, including representatives from the TC Department and other agency departments—specifically, the Departments of Management, Safeguards, and Nuclear Safety and Security. We obtained and analyzed documentation and data from IAEA, including annual reports, financial data, program guidance and strategy documents, auditor reports, and speeches and other statements pertaining to the TC program. We interviewed knowledgeable IAEA officials on the reliability of TC financial data and data on the numbers of TC projects and determined that the data were sufficiently reliable for our purposes.

As initially agreed with your office, we intended to assess the extent to which TC projects have contributed to the safety and security of nuclear installations around the world. We developed a judgmental sample of TC projects to serve as the basis for our assessment and interviews with relevant IAEA officials. However, because IAEA did not provide us with an opportunity to interview relevant IAEA officials who oversee these projects, we were unable to sufficiently assess the contributions of the TC program in improving the worldwide safety and security of nuclear facilities. In addition, because IAEA restricted our access to information relating to reviews of TC projects by its Safeguards Department, we were unable to draw conclusions on the effectiveness of IAEA's internal review of TC projects for proliferation concerns. As agreed, we revised the objectives of our review accordingly.

We conducted this performance audit from December 2007 to March 2009 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our

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findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Appendix I provides more detailed information on our scope and methodology.

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## Results in Brief

Neither State nor IAEA has sought to systematically limit or prevent TC assistance to countries that (1) have been identified as sponsors of terrorism, (2) are not parties to the NPT, and (3) have not completed comprehensive safeguards or additional protocol agreements with IAEA. Specifically:

- State officials told us that the United States does not systematically try to limit TC projects in Cuba, Iran, Sudan, and Syria—which the department lists as sponsors of terrorism. These four countries received more than \$55 million in TC assistance from 1997 through 2007. Moreover, IAEA officials told us that the agency does not seek to limit or condition TC assistance in countries such as Iran and Syria that have been found or suspected by IAEA of having violated their safeguards commitments and may be engaged in undeclared nuclear activities. Under U.S. law, however, State withholds a portion of its contributions, except for certain projects, to the TCF equal to the U.S. proportionate share of TC expenditures in Cuba. In the past, State has withheld a proportionate share of its TCF contribution for Iran, Libya, and the Territories Under the Jurisdiction of the Palestinian Authority. Regarding Iran, State reported in 2007 that three TC projects in that country were directly related to the Iranian nuclear power plant at Bushehr. IAEA’s Deputy Director General for the TC program told us that “there are no good countries and there are no bad countries” participating in the program and that it is more important for the program to engage as many countries as possible than to exclude some nations on the basis of political factors.
- From 1997 through 2007, the TC program disbursed approximately \$24.6 million in assistance to India, Israel, and Pakistan, although these states are not party to the NPT. IAEA officials told us that NPT membership is not required for IAEA member states to receive TC assistance under the agency’s statute. State officials told us that the United States does not attempt to systematically limit TC program support to countries that are not signatories to the NPT.
- Nonnuclear weapon state members of IAEA are not required to complete comprehensive safeguards or additional protocol agreements with IAEA to be eligible for TC assistance, even though U.S. and IAEA officials have stressed the need for all countries to bring such arrangements into force as soon as possible. We found that 17 states and territories without

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comprehensive safeguards agreements in force in 2007 received approximately \$6.7 million in TC program assistance that year, while 62 states and territories without an additional protocol in force in 2007 received approximately \$43.2 million in assistance that same year.

The proliferation concerns associated with the TC program are difficult for the United States to fully identify, assess, and resolve for the following reasons:

- *Limited information on TC project proposals.* State, DOE, and national laboratory officials told us that there is no formal mechanism for obtaining TC project information from IAEA during the proposal development phase. Of the 1,565 proposed TC projects DOE and the national laboratories reviewed for possible proliferation risks from 1998 through 2006, information for 1,519 proposals, or 97 percent, consisted of only project titles.
- *Limited State documentation on how proliferation concerns of TC proposals were resolved.* From 1998 through 2006, DOE and the national laboratories identified 43 of the 1,565 TC proposals they reviewed as having some degree of potential proliferation risk. IAEA approved 34 of these 43 proposals. However, we were unable to determine if State addressed DOE's and the national laboratories' concerns because—with the exception of one case—State could not document how it responded to these findings. State officials told us that as a result of a 2005 reorganization of the department's arms control and nonproliferation bureaus, the office that monitors TC program issues has fewer staff to conduct IAEA oversight.
- *Shortcomings in U.S. policies and IAEA procedures related to TC program fellowships.* State's Office of Multilateral Nuclear and Security Affairs lacks a formal policy and specific criteria to serve as the basis for approving or rejecting requests from TC fellows to study nuclear issues in the United States. In addition, we found shortcomings in the extent to which IAEA monitors the proliferation risks of TC fellowships. Specifically, IAEA does not systematically track individuals who have completed fellowships to determine whether they are still working on peaceful nuclear programs in their home country.

We identified challenges limiting the TC program's long-term effectiveness in three areas: program performance metrics, financial resource constraints, and project and program sustainability. Specifically:

- *Inadequate program performance metrics.* IAEA does not have adequate metrics for measuring the impact of the TC program. For example, IAEA

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officials told us that performance metrics developed in 2002 did not assess the impact of TC projects in meeting specific member state development and other needs, such as the number of additional cancer patients treated or the number of new nuclear security safety regulations promulgated. IAEA's internal auditor has also reported that the TC program lacks appropriate performance indicators.

- *Financial resource constraints.* Many member states do not pay their full share of support to the TCF but nevertheless receive TC assistance, while some high-income countries also receive support from the TC program. The TCF experienced a shortfall in 2007 of \$3.5 million, or 4 percent, of the \$80 million total target budget because 62 member states did not pay their full contributions, including 47 countries that made no payment at all. In addition, 13 member states that the UN has defined as high-income received TC assistance in 2007, but IAEA has not developed a policy or criteria for determining when such countries should be graduated from assistance.
- *TC project and program sustainability challenges.* IAEA does not systematically review completed TC projects to determine or verify whether the host country is sustaining project activities and results. In addition, the TC program overall faces sustainability challenges because program funding is distributed across 18 different technical areas, making it difficult for IAEA to set clear program priorities and to maximize the impact of limited program resources. Finally, IAEA has developed outreach strategies to engage new potential partners and donors—primarily from international development organizations—to help sustain the TC program. However, this effort faces several limitations and shortcomings.

We are asking Congress to consider directing State to withhold a share of future annual contributions to the TCF that is proportionate to the amount of funding provided from the fund for U.S.-designated state sponsors of terrorism and other countries of concern, as it currently does with Cuba and has done in the past with Iran, Libya, and the Territories Under the Jurisdiction of the Palestinian Authority. We are also recommending that the Secretary of State, working with IAEA and other member states through the Board of Governors, explore a number of actions to address other proliferation and management concerns in the TC program, including (1) developing formal mechanisms for timely information sharing on TC project proposals between IAEA and the United States early in the project development phase; (2) strengthening mechanisms for collecting member state contributions to the TCF; and (3) establishing criteria and processes for graduating high-income countries from further TC program support.

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We provided a draft of this report to State and DOE for formal comment. We also provided IAEA with a detailed summary of the facts contained in the draft report. DOE and IAEA provided technical comments that we incorporated as appropriate. State agreed with 7 of our 10 recommendations, neither agreed nor disagreed with the other three recommendations, and strongly opposed the matter for congressional consideration. State objected to the matter for congressional consideration for a number of reasons, stating that (1) it would be counterproductive to a separate recommendation we made encouraging all states to pay their full share to the TCF; (2) it would not stop TC projects in targeted countries because TCF funding is fungible; (3) Congress has exempted IAEA contributions from this type of proportionate withholding; (4) none of the TC projects in state sponsors of terrorism have been shown to have contributed to a weapons of mass destruction (WMD) program; (5) there are adequate safeguards within IAEA to prevent TC projects from contributing to a WMD program; and (6) it would negatively impact the ability of the United States to achieve other critical objectives within IAEA.

We do not believe the matter for congressional consideration is unique or unprecedented. Congress currently requires the withholding of a proportionate share of the U.S. contribution to the TCF for certain projects in Cuba, and has required withholding in the past for Iran, Libya, and the Territories Under the Jurisdiction of the Palestinian Authority. However, in order to give Congress greater flexibility and more information, we have broadened the matter for congressional consideration to give Congress the option of requiring State to report on its rationale for not withholding a proportionate share of the U.S. contribution to the TCF for U.S.-designated state sponsors of terrorism.

Notwithstanding our modification to the matter for congressional consideration, we still disagree with State's specific objections to it for the following reasons. First, we do not believe it is counterproductive to our other recommendation, which is geared toward strengthening mechanisms for collecting contributions to the TCF from member states that are receiving TC assistance, not from major donors such as the United States. Second, we believe that withholding a proportionate share of the U.S. contribution to the TCF for state sponsors of terrorism and other countries that the United States has sanctioned is a matter of fundamental principle and intended to foster a more consistent U.S. policy toward such nations. Third, while U.S. contributions to IAEA were exempted from the proportionate share withholding requirement in 1994, we note that the law was subsequently amended to require State to withhold a proportionate

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share of funding to IAEA for certain projects in Cuba and for all projects in Iran if State determines that such projects in Iran are inconsistent with U.S. nuclear nonproliferation and safety goals, will provide Iran with training or expertise relevant to the development of nuclear weapons, or are being used as a cover for the acquisition of sensitive nuclear technology. Fourth, given the limited information available on TC projects and the dual-use nature of some nuclear technologies and expertise, we do not believe State can assert with complete confidence that TC assistance has not advanced WMD programs in U.S.-designated state sponsors of terrorism. Fifth, we do not share State's confidence in IAEA's internal safeguards to prevent TC projects from contributing to weapons development, since IAEA's information restrictions prevented us from assessing the effectiveness of its TC project review system. Lastly, neither we nor State can determine how other states might react to an increase in the United States' proportionate withholding of funding to the TCF and how it would affect U.S. ability to achieve other objectives within the agency.

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## Background

Overall policy direction for the TC program is set by IAEA's policy-making bodies—the General Conference and the Board of Governors. The United States is a permanent member of the Board of Governors, which typically meets 5 times per year. IAEA's Secretariat—led by a Director General and structured into six functional departments—is responsible for implementing policies established by the Board of Governors and the General Conference. The Department of Technical Cooperation, which is headed by a Deputy Director General, is structured primarily around four regional divisions: Africa, Asia and the Pacific, Europe, and Latin America and the Caribbean. The department also includes a Division of Programme Support and Coordination, which is responsible for developing TC program strategies, communications, and partnerships, and managing relevant information systems and TC financial resources. In addition, an external auditor and IAEA's Office of Internal Oversight Services conduct annual audits and reviews of the TC program.

Several individuals are involved in the TC project team responsible for developing and overseeing the project. The team includes (1) a project officer within the TC Department; (2) a technical officer from each relevant IAEA department (such as the Department of Nuclear Sciences and Applications); and (3) a national liaison officer at the country level who represents the member state, serves as coordinator for TC projects in the host country, and acts as liaison with host country governments and institutes.

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Typically, the TC program develops and approves new projects on a 2-year cycle. The most recent set of new proposals were approved in fall 2008.<sup>10</sup> Member states begin submitting project proposal concepts to IAEA in September of the year prior to approval. IAEA officials screen concepts through the fall, and member states develop and refine their proposals through March of the approval year. By July, IAEA's Secretariat comes to a final agreement on TC project proposals that it will back for approval by the Technical Assistance and Cooperation Committee and the Board of Governors. The TC project proposals are discussed with member states in bilateral and regional group meetings during IAEA's General Conference, which is held in September; in November, the Technical Assistance and Cooperation Committee and the Board of Governors give final approval to the proposed TC projects.

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## The United States and IAEA Do Not Systematically Limit or Prevent TC Assistance to Countries Posing Potential Terrorism and Proliferation Concerns

Neither the United States nor IAEA seeks to systematically limit or deny TC assistance to countries designated as state sponsors of terrorism, even though under U.S. law these countries are subject to sanctions. In addition, TC assistance has been provided to countries that are not party to the NPT, and neither the United States nor IAEA has sought to exclude these nations from TC assistance. Finally, while the United States has encouraged IAEA to condition TC assistance to countries according to their safeguards status, IAEA does not take this factor into account when allocating program funds. Appendix II provides more detailed information on the states and territories that received TC assistance in 2007.

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## Four Countries Designated by the United States as State Sponsors of Terrorism Receive TC Assistance

Countries deemed by State as state sponsors of terrorism—meaning the Secretary of State has determined that the countries' governments have repeatedly provided support for acts of international terrorism—have been provided nuclear equipment and other assistance through the TC program. The United States has designated four countries—Cuba, Iran, Sudan, and Syria—as state sponsors of terrorism, pursuant to several U.S.

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<sup>10</sup>Occasionally, a small number of TC projects are approved out of cycle; for instance, three new TC projects were approved at the fall 2007 meeting. In addition, in 2008, the TC program cycle shifted temporarily to a 3-year cycle, in which new projects were approved for 2009 through 2011, in order to synchronize future TC cycles with the planning cycle of IAEA's "regular program."



laws.<sup>11</sup> According to our review of IAEA data and financial records, 111 TC projects were approved for these four countries from 1997 through 2007, and they received approximately \$55.7 million in TC assistance over that period. These projects ranged across a number of areas, from applying nuclear technologies to treat diseases and improve crop productivity to assisting nuclear power development. Table 1 shows the dollar amount of TC assistance each U.S.-designated state sponsor of terrorism received from 1997 through 2007.

**Table 1: TC Assistance Disbursed to U.S.-designated State Sponsors of Terrorism, 1997 through 2007**

Dollars in thousands

U.S.-designated state sponsors of terrorism	Total TC assistance received, 1997 through 2007
Cuba	\$13,740.8
Islamic Republic of Iran	15,571.7
Sudan	11,913.9
Syrian Arab Republic	14,469.0
<b>Total</b>	<b>\$55,695.4</b>

Source: GAO analysis of IAEA data.

According to State, the United States has applied several types of sanctions to these four countries, including restrictions on U.S. foreign assistance, a ban on defense exports and sales, certain controls over exports of dual-use items,<sup>12</sup> and miscellaneous financial and other restrictions. These sanctions notwithstanding, direct U.S. nuclear trade with these countries involving the types of technologies provided by the TC program might not be permitted under U.S. adherence to other international nonproliferation controls. For instance, in a 2007 report to Congress, State concluded that three TC projects involving technology transfer for the operation and maintenance of the Iranian nuclear power plant at Bushehr could be subject to multilateral export controls if Iran were to procure such technology directly from suppliers. The State report

<sup>11</sup>On October 11, 2008, the United States rescinded North Korea's designation as a state sponsor of terrorism. However, North Korea withdrew its membership in IAEA in 1994 and has not received TC program assistance since then.

<sup>12</sup>Dual-use refers to equipment or technology that can contribute both to nuclear energy and other peaceful nuclear applications or nuclear weapons development or production.

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noted, “[u]nder the Nonproliferation Principle of the NSG [Nuclear Suppliers Group]<sup>13</sup> Guidelines the United States and other responsible members of the NSG would deny such direct transfers.”

The United States has not sought to systematically exclude or limit the four U.S.-designated state sponsors of terrorism from TC assistance. State officials told us that the department would not recommend withholding U.S. funding to the TC program because of the support that IAEA provides to these four countries. They said that it is a long-standing department policy to pay the full share of U.S. support to the TC program because doing so helps maintain international political support for and participation in IAEA, including international support for safeguards. In addition, because TCF resources are fungible, State officials asserted that withholding U.S. contributions to the TCF to punish state sponsors of terrorism would have no practical impact on the TC funding these nations receive. A U.S. Mission official told us that once the United States provides its contribution to the TCF, it cedes control over how the funds are disbursed by IAEA.

Several laws govern U.S. support to the TC program. One restriction under these laws prohibits U.S. funds contributed to IAEA from being used for projects in Cuba, except in certain circumstances. Accordingly, State withholds a portion of its voluntary contribution to the TCF equal to the U.S. proportionate share of the TC program’s expenditures in Cuba.<sup>14</sup> In the past, the United States also withheld a proportionate share of its TCF contribution for Iran, Libya, and Territories Under the Jurisdiction of the Palestinian Authority. State also must report annually to Congress on all

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<sup>13</sup>The Nuclear Suppliers Group is a group of nuclear supplier countries that seeks to contribute to the nonproliferation of nuclear weapons through the implementation of guidelines for nuclear exports and nuclear-related exports.

<sup>14</sup>In March 1997, we reported on IAEA’s technical assistance to Cuba. See GAO, *Nuclear Safety: International Atomic Energy Agency’s Technical Assistance for Cuba*, [GAO/RCED-97-72](#) (Washington, D.C.: Mar. 24, 1997).

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IAEA programs or projects in certain countries, including Burma (Myanmar), Cuba, Iran, North Korea, and Syria.<sup>15</sup>

IAEA officials told us that the TC program does not attempt to exclude countries on the basis of their status as U.S.-designated state sponsors of terrorism or other political considerations. Under the TC program's guiding principles, for example, the provision of TC assistance is not subject to any political, economic, military, or other conditions that are inconsistent with IAEA's statute. Moreover, according to the Deputy Director General for the TC program, requests for TC assistance are evaluated strictly on technical merits and the contributions of proposed projects to a nation's development priorities, subject to the conditions of the IAEA statute, IAEA guiding principles and operating rules pertaining to technical assistance, and any relevant decisions by the Board of Governors and the UN Security Council. This official added that the program seeks to include as many countries as possible and that "there are no good countries and there are no bad countries" participating in the program. In her view, denying or limiting participation of member states in the TC program was a matter for the Board of Governors to consider.

Other IAEA officials told us that under the agency's statute, IAEA's Secretariat is powerless to limit or condition TC assistance to specific countries, even in cases where countries have been deemed by the Board of Governors to be violating their IAEA obligations or in cases where recipient countries were suspected of being engaged in undeclared, clandestine nuclear activities. For instance, the Board of Governors determined in September 2005 that Iran had breached its safeguards obligations and was not complying with IAEA's statute. However, TC projects in Iran were not restricted until February 2007 following a UN Security Council resolution on Iran's nuclear

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<sup>15</sup>Between 2003 and 2008, State had two additional, nearly duplicate reporting obligations. First, it had to undertake a comprehensive annual review of the IAEA programs and projects in Burma, Cuba, Iran, Iraq, Libya, North Korea, and Syria and submit it to Congress. Annual reviews of programs and projects in Iraq and Libya were only required until 2006 and 2008, respectively. Second, it had to submit to Congress a report detailing certain aspects of IAEA programs in Iran and describing IAEA programs and projects in the countries covered by the first reporting requirement. Both of these reports had to address inconsistencies between IAEA programs and projects and U.S. nuclear nonproliferation and safety goals in those countries.

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activities.<sup>16</sup> In addition, in 2008, IAEA's Director General stated it would be inappropriate to block approval of a TC project in Syria for a nuclear power plant feasibility study before IAEA verified claims concerning Syria's alleged construction of an undeclared nuclear reactor. According to State officials, several countries, including the United States, asserted that the approval of this project would be "wholly inappropriate" when Syria had not provided all of the cooperation required by IAEA to investigate these allegations. IAEA's Board of Governors ultimately approved the project in November 2008. The United States did not attempt to block approval of the project after receiving assurances that IAEA would monitor the project closely, report as appropriate, and ensure that any equipment provided under the project would be used only for the intended purposes.

Finally, in addition to providing assistance to the four countries the United States has designated as state sponsors of terrorism, the TC program has also provided nuclear technology and expertise to other countries that the United States has sanctioned or taken other punitive actions against. Examples of such countries and the total amounts of TC assistance provided to them from 1997 through 2007 include the following:

- Approximately \$7.3 million for Burma, which is subject to targeted U.S. trade, financial, and other sanctions. The Secretaries of State and of Energy have declared jointly that the development of nuclear infrastructure of any kind in Burma would be inappropriate. TC projects have been approved for Burma to improve nuclear instrument repair and maintenance services, enhance pest control, and apply nondestructive testing techniques in construction projects.
- Approximately \$9.7 million for Belarus, which the United States has characterized as "a regime of repression in the heart of Europe" and against which the United States has imposed targeted financial sanctions and travel restrictions. TC support has been provided to assist Belarus in minimizing threats posed by radioactive waste at former military sites, establishing a center of competence on radiation oncology, and remediating areas affected by the Chernobyl accident.

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<sup>16</sup>In December 2006, the UN Security Council adopted resolution 1737, sanctioning Iran, in part, for its failure to suspend its uranium enrichment activities. One of the resolution's provisions prohibited technical cooperation provided to Iran by IAEA that relates to proliferation-sensitive nuclear activities. Pursuant to this resolution, IAEA's Director General provided a report in February 2007 identifying 22 TC projects in Iran that could not proceed or proceed only on a case-by-case basis, based on an evaluation of the projects' contributions to proliferation-sensitive activities.

- Approximately \$6.1 million for Venezuela, which, among other things, State has determined to be engaging in diplomacy designed to deliberately undermine U.S. interests, including deepening relations with Iran and publicly supporting Iran’s nuclear program. IAEA has approved TC assistance for Venezuela to help it strengthen its technical capabilities in radiotherapy, nuclear medicine, and radiopharmaceutical services, and to more effectively apply nuclear techniques in managing water resources.

Based on our review of recent project summaries, the TC assistance provided to these countries does not appear to involve support that could have direct weapons applications. However, as we discuss in the following section, given the dual-use nature of some nuclear technology and the absence of more complete information from IAEA, it is difficult for the United States to make firm judgments about the proliferation risks of TC proposals and projects.

## Non-NPT Countries Are Receiving TC Assistance

U.S. and IAEA officials have described the NPT as the cornerstone of the international nuclear nonproliferation regime and a key legal barrier to nuclear weapons proliferation. However, states that are not party to the NPT—India, Israel, and Pakistan—received approximately \$24.6 million in TC assistance from 1997 through 2007. India has not received TC assistance through national-level TC projects but has received TC support as a participant in regional TC projects. Israel and Pakistan have received support for 63 national-level projects, as well as for regional TC projects. For example, national TC projects in Israel and Pakistan have included assistance to control fruit flies and suppress other pests, enhance nuclear medicine practices and establish radiation physics courses, and improve nuclear safety. Table 2 shows the total amount of TC assistance provided to each of these countries from 1997 through 2007.

**Table 2: TC Assistance Disbursed to Countries Not Party to the NPT, 1997 through 2007**

Dollars in thousands	
Non-NPT states	Total TC assistance received, 1997 through 2007
India	\$3,419.1
Israel	3,891.5
Pakistan	17,254.9
<b>Total</b>	<b>\$24,565.5</b>

Source: GAO analysis of IAEA data.

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The TC program does not differentiate between states based on their NPT status. IAEA officials told us that creation of IAEA predates the entry into force of the NPT, and treaty membership is not obligatory for IAEA membership and receipt of TC assistance under the agency's statute. India, Israel, and Pakistan joined IAEA before the NPT entered into force.

State officials told us that the United States does not seek to systematically limit TC program support to countries that are not signatories to the NPT. State officials also told us that, in accordance with statutory requirements, State must annually determine and report to Congress that Israel's right to participate in IAEA activities is not being denied. However in its annual funding pledge to IAEA, State asks that IAEA give preference to states that are party to the NPT in allocating the U.S. contribution to the TC program.

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### IAEA Does Not Condition TC Assistance on the Basis of the Recipient Country's Safeguards Status

While U.S. and IAEA officials have stressed the need for all countries to bring into force comprehensive safeguards agreements and additional protocols with IAEA as soon as possible, neither the United States nor IAEA has sought to limit TC funding to countries that have not implemented such agreements. Together, these safeguards measures allow IAEA to provide assurances that all declared nuclear material is being used for peaceful purposes and that a country has declared all of its nuclear material and activities.

Nearly all states receiving TC assistance are nonnuclear weapon state parties to the NPT. Under Article IV of the NPT, all states party to the treaty have the right to participate in the exchange of equipment, materials, and scientific and technological information for the peaceful uses of nuclear energy. According to IAEA, Article III of the NPT also makes it mandatory for all nonnuclear-weapon states to conclude comprehensive safeguards agreements with the agency. These agreements are to be concluded by such states within 18 months of their accession to the treaty. The United States and IAEA have recognized an inherent linkage between nonnuclear weapon states' rights to access peaceful nuclear technology and their obligation to accept safeguards on their nuclear activities, although State officials told us that to limit TC funding to states that have not completed comprehensive safeguards agreements with IAEA could be seen as inconsistent with IAEA's statute.

IAEA has not conditioned TC assistance provided to recipient states on the basis of their safeguards status. According to our analysis of IAEA records, 17 countries and territories that did not have comprehensive

safeguards agreements in force with the agency at the end of 2007 received approximately \$6.7 million, or about 7 percent, of the \$93.3 million in TC assistance disbursed in 2007. This list includes three states and one nonstate territory that are not party to the NPT—India, Israel, Pakistan, and the Territories Under the Jurisdiction of the Palestinian Authority. The remaining 13 states have all been party to the NPT longer than 18 months—in most cases for more than 10 years—meaning they have not fulfilled their NPT Article III obligation. Table 3 shows the states and territories that did not have comprehensive safeguards agreements in effect in 2007 and the amounts of TC assistance they received that year.

**Table 3: TC Assistance Received by States and Territories without IAEA Comprehensive Safeguards Agreements in Force, 2007**

Dollars in thousands

<b>States and territories without IAEA comprehensive safeguards agreements in force, 2007</b>	<b>Total TC assistance received in 2007</b>
Angola	\$495.5
Benin	371.6
Central African Republic	365.3
Chad	143.3
Eritrea	242.2
Gabon	159.1
India	252.8
Israel	251.6
Kenya	1,093.5
Islamic Republic of Mauritania	156.1
Montenegro	18.9
Mozambique	17.5
Pakistan	2,233.9
Qatar <sup>a</sup>	232.8
Saudi Arabia <sup>b</sup>	321.5
Sierra Leone	348.4
Territories Under the Jurisdiction of the Palestinian Authority	26.3
<b>Total</b>	<b>\$6,730.3</b>

Source: GAO analysis of IAEA data.

<sup>a</sup>Qatar brought a comprehensive safeguards agreement into force in January 2009.

<sup>b</sup>Saudi Arabia brought a comprehensive safeguards agreement into force in January 2009.

In addition, we found that 62 states and territories without an additional protocol agreement in effect with IAEA received approximately \$43.2 million, or approximately 46 percent, of TC assistance in 2007. Without additional protocols in force, IAEA has limited ability to detect clandestine nuclear programs, and its inspection efforts remain focused on verifying declared nuclear material, activities, and facilities.<sup>17</sup> Both State and IAEA officials have asserted that the additional protocol should become the new universal safeguards standard. Table 4 lists the states and territories without additional protocols in effect as of the end of 2007 and the amounts of TC assistance they received that year.

**Table 4: TC Assistance Received by States and Territories without IAEA Additional Protocols in Force, 2007**

Dollars in thousands

<b>States and territories without IAEA additional protocols in force, 2007</b>	<b>Total TC assistance received in 2007</b>
Albania	\$784.1
Algeria	1,361.4
Angola	495.5
Argentina	1,543.2
Belarus	969.8
Belize	61.4
Benin	371.6
Bolivia	817.4
Bosnia and Herzegovina	399.2
Brazil	1,480.4
Brunei Darussalam	0.5
Burma (Myanmar)	670.4
Cambodia	0.9
Cameroon	412.3
Central African Republic	365.3
Chad	143.3
Colombia	778.0

<sup>17</sup>As we noted in 2005, IAEA faced a number of challenges that hampered its ability to implement strengthened safeguards, including that almost two-thirds of NPT signatories had not brought additional protocols into force. See GAO, *Nuclear Nonproliferation: IAEA Has Strengthened Its Safeguards and Nuclear Security Programs, but Weaknesses Need to Be Addressed*, [GAO-06-93](#) (Washington, D.C.: Oct. 7, 2005).



<b>States and territories without IAEA additional protocols in force, 2007</b>	<b>Total TC assistance received in 2007</b>
Costa Rica	749.6
Côte d'Ivoire	253.8
Dominican Republic	256.9
Egypt	1,280.9
Eritrea	242.2
Ethiopia	2,187.5
Gabon	159.1
Gambia	3.5
Guatemala <sup>a</sup>	435.6
Honduras	394.5
India	252.8
Islamic Republic of Iran	1,000.0
Iraq	190.6
Israel	251.6
Kenya	1,093.5
Kyrgyzstan	542.6
Lebanon	502.3
Malaysia	1,012.8
Islamic Republic of Mauritania	156.1
Mexico	962.8
Republic of Moldova	905.4
Montenegro	18.9
Morocco	996.9
Mozambique	17.5
Namibia	421.1
Pakistan	2,233.9
Philippines	1,510.7
Qatar	232.8
Saudi Arabia	321.5
Senegal	983.9
Serbia	2,129.4
Sierra Leone	348.4
Singapore <sup>b</sup>	137.8
Sri Lanka	810.8
Sudan	1,148.1
Syrian Arab Republic	1,525.4

<b>States and territories without IAEA additional protocols in force, 2007</b>	<b>Total TC assistance received in 2007</b>
Territories Under the Jurisdiction of the Palestinian Authority	26.3
Thailand	1,057.4
Tunisia	789.0
United Arab Emirates	158.7
Venezuela	681.3
Vietnam	1,770.8
Yemen	1,179.2
Zambia	618.3
Zimbabwe	571.0
<b>Total</b>	<b>\$43,177.9</b>

Source: GAO analysis of IAEA data.

<sup>a</sup>Guatemala brought an additional protocol into force in May 2008.

<sup>b</sup>Singapore brought an additional protocol into force in March 2008.

In its annual pledge of funding to the TC program, State asks that IAEA consider whether a recipient country has in force a comprehensive safeguards agreement and an additional protocol when it allocates TC funds. However, according to IAEA officials, IAEA's Secretariat is not in a position to take such considerations into account in the absence of a decision by its policy-making bodies. The Deputy Director General for the TC program, for example, told us that such guidelines would need to be developed by the Secretariat after consultation with and approval by the member states. IAEA officials stated that while IAEA's statute, TC program guidance, and TC program agreements with individual member states include project- and technology-specific safeguards conditions and peaceful use obligations, these documents do not require that member states have comprehensive safeguards agreements or additional protocols in force to receive assistance.

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## The United States Faces Difficulties in Identifying, Assessing, and Resolving TC Program Proliferation Concerns

The proliferation concerns associated with the TC program are difficult for the United States to fully identify, assess, and resolve for several reasons. First, while State has implemented an interagency process to review proposed TC projects for proliferation risks, consistent with the recommendation in our 1997 report, the effectiveness of these reviews is limited because IAEA does not provide the United States with sufficient or timely information on TC proposals. Second, for TC proposals that DOE and the national laboratories have identified as having possible proliferation risks, State was unable to provide us with documentation explaining how those proliferation concerns were addressed. Finally, State lacks a formal policy that identifies countries from which the United States will not accept TC fellows, and IAEA does not systematically monitor former TC fellows to determine whether they still reside in their home country and are still involved in peaceful nuclear research related to their fellowship studies.

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## The United States Does Not Comprehensively Evaluate TC Proposals for Proliferation Concerns because IAEA Does Not Provide Sufficient and Timely Information

DOE and the national laboratories began reviewing TC proposals for possible proliferation concerns and providing their findings to State as the result of a recommendation in our 1997 report on the TC program.<sup>18</sup> However, this review process is deficient because DOE and the national laboratories receive limited information to conduct their proliferation assessments and have little time to complete them. According to State, DOE, and national laboratory officials, the United States has had difficulty in obtaining detailed information on proposed TC projects during the proposal development phase. The initial proposal development process is internal to IAEA's Secretariat and information is kept confidential between the recipient country and the agency and is not releasable to third parties, including the United States. According to State, DOE, and national laboratory officials, IAEA member state representatives, including U.S. Mission staff, do not have a formal mechanism to obtain information on project proposals while they are under development.

DOE and national laboratory officials told us that they attempt to make the best possible determination of TC proposal proliferation risks on the basis

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<sup>18</sup>For TC proposals approved between 1998 and 2004, the Oak Ridge National Laboratory (ORNL) was primarily responsible for conducting technical reviews of proposed TC projects for proliferation concerns. In the 2006 cycle, the Los Alamos National Laboratory (LANL) led the technical reviews of TC proposals. For the 2008 review of TC proposals, DOE initiated a multilaboratory approach to assessing potential TC project proliferation concerns.

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of all available information. However, in the vast majority of cases, the information they receive on TC proposals is very limited, according to our analysis of DOE and national laboratory data. Specifically, we found that national laboratory officials received only the title of proposed projects for 97 percent—or for 1,519 of 1,565—of proposed TC projects they reviewed from 1998 through 2006. For the remaining 3 percent, or 46 of the proposed projects, DOE and the national laboratories were able to obtain some additional information on the proposed projects. See appendix III for more specific information on the number of TC proposals reviewed by DOE and the national laboratories from 1998 through 2006.

DOE and national laboratory officials told us that a TC project proposal title can occasionally raise proliferation concerns but that the title alone is generally insufficient to reliably assess proliferation risk. Moreover, proposal titles can be misleading and obscure more serious proliferation implications. For instance, the 2006 TC proposal from Iran requesting assistance for the completion of the Arak heavy water research reactor—a type of reactor that could be a source of plutonium for nuclear weapons—was entitled “Strengthening Safety Capabilities for the Construction of a Research Reactor.” Iran asserted that the reactor was intended for the production of medical isotopes, and the proposal was approved for funding by IAEA’s Secretariat. However, as a result of objections by the United States and other nations, the Board of Governors ultimately did not approve this proposal.

In addition to the limited information on TC proposals available to the national laboratories, the dual-use nature of some nuclear technology also complicates efforts to assess TC proposals for proliferation risks. IAEA applies safeguards to nuclear material, equipment, and facilities provided through the TC program in four “sensitive technological areas”—uranium enrichment, spent fuel reprocessing, heavy water production, and handling of plutonium and mixed uranium-plutonium fuel. These four areas relate to the production and handling of fissile material. However, according to DOE and national laboratory officials, these four sensitive areas do not address all technologies related to the production of fissile material. For example, “nonsensitive” technology associated with the design and operation of civilian, light water power reactors might prove useful to countries seeking to design and build a plutonium production reactor. TC projects providing such technology might therefore raise proliferation concerns. Other “nonsensitive” skills and expertise that states acquire through TC assistance might provide basic knowledge useful to weapons, such as radioactive materials handling, familiarity with chemical processes

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and properties of nuclear materials, and use of various instruments and control systems.

Even in cases where more information on TC proposals was obtained, national laboratory officials told us that they still often lacked crucial details—such as equipment specifications—to reliably assess the proliferation risks. As an example, national laboratory officials told us that some TC proposals could include requests for procurement of “hot cells” to produce isotopes—a technology with dual-use implications.<sup>19</sup> However, without specific technical details of the hot cell, it would not be possible to determine the potential proliferation risks associated with such a device.

In addition, DOE and national laboratory officials told us that in recent years, they have received less information about proposed TC projects. Moreover, DOE and national laboratory officials told us that such information is arriving closer to the time when such projects must be approved by the Technical Assistance and Cooperation Committee and the Board of Governors. The lack of full and timely information on TC project proposals complicates efforts by the United States and other IAEA member states to make informed decisions about TC proposals, including whether they raise proliferation concerns. State, DOE, and national laboratory officials told us that it is preferable to raise potential proliferation concerns about TC proposals with IAEA officials early in the development cycle, when such project proposals can be modified more readily.

In 2004, IAEA’s Safeguards Department began reviewing TC projects for possible proliferation risks. This review process includes evaluating proliferation risks of TC project proposals and reviewing all procurement requests made to the agency under ongoing TC projects. However, IAEA officials told us that the results of the Safeguards Department reviews are confidential and are not shared with the United States or other governments. IAEA officials declined to provide us with certain basic information regarding the results of these reviews, including the total number of TC proposals that the Safeguards Department identified as having possible proliferation concerns.

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<sup>19</sup>Hot cells are shielded containment boxes or rooms with remote handling equipment for examining and processing radioactive materials.

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## State Could Not Substantiate How It Addressed TC Proposals Identified by DOE as Having Possible Proliferation Risks

Under the interagency process for reviewing TC proposals for proliferation concerns, DOE and the national laboratories provide State with their assessments of the proposals. State, however, was unable to provide us with documentation describing the actions it took on the basis of DOE's and the national laboratories' findings or how, if at all, it raised their concerns with IAEA. According to DOE and the national laboratories' assessment of TC proposals from 1998 through 2006, 43 of the 1,565 TC proposals reviewed had some degree of potential proliferation concern or required additional information to more clearly establish potential proliferation risk. The 43 project proposals for which the national laboratories raised potential concerns included, for example, projects to assist countries in various aspects of developing nuclear power reactors and research reactors, handling nuclear fuel, and using nuclear techniques in materials testing and other industrial practices.

We found that IAEA approved at least 34 of these 43 proposals. Of the remaining 9 proposals, 4 were not approved internally by IAEA's Secretariat or—in the case of Iran's 2006 Arak heavy water reactor proposal—by the Board of Governors, and 5 proposals in 1998 were reviewed by ORNL in a classified assessment. We did not determine whether those 5 proposals were approved by IAEA.

We requested information from State's Office of Multilateral Nuclear and Security Affairs describing how it responded to DOE's and the national laboratories' findings of potential proliferation concerns among the TC proposals they reviewed. However, with the exception of documentation pertaining to U.S. objections on the Iranian heavy water reactor proposal in 2006, State was unable to provide us with any records documenting policy discussions or actions it took to address concerns in other TC proposals highlighted by DOE and the national laboratories. As a result, it is unclear what actions, if any, State took to address potential proliferation concerns of specific TC proposals identified by DOE and the national laboratories. State officials told us that records substantiating discussions within State on the DOE and national laboratory findings existed but could not be retrieved from State's data and document management systems.

State officials told us that a 2005 reorganization of the department's arms control and nonproliferation bureaus resulted in the loss of staff in the office overseeing IAEA issues, limiting its ability to effectively monitor TC program developments. Specifically, they said that prior to the 2005 reorganization, there were 14 full-time equivalent personnel working on IAEA- and NPT-related issues, but that this number was reduced to 5 full-

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time equivalent personnel due to the reassignment and retirement of personnel following the reorganization.

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## U.S. Policies and IAEA Procedures for TC Program Fellowships Have Several Shortcomings

State has not developed a formal policy that identifies countries that would not be eligible to send TC fellows to the United States to study nuclear issues. In addition, IAEA does not have a systematic process in place to track and monitor former TC fellows to determine, for instance, whether they still reside in their home country and are still involved in peaceful nuclear research related to their fellowship studies.

The United States accepts TC fellows and TC project participants from foreign countries. The acceptance process involves several steps. First, foreign nationals interested in a TC fellowship apply to IAEA's TC Department, which reviews the applications and decides which candidates to accept or reject. IAEA identifies fellows who would be appropriate to place in the United States for studies. For approved applications, IAEA then sends a formal request to the U.S. Mission asking that the applicants be permitted to study in the United States at a specific institute.

The U.S. Mission forwards the applications to State's Office of Multilateral Nuclear and Security Affairs within the International Security and Nonproliferation Bureau and to the Argonne National Laboratory. The State office reviews and approves or rejects the applications, and shares them with other members of the U.S. interagency committee on IAEA TC issues. In addition, State officials told us that foreign nationals requesting TC fellowships at DOE facilities would be reviewed against requirements in DOE orders. The Argonne National Laboratory, under a contract with State, facilitates placement of fellows approved by State at the institutes proposed by IAEA or at alternative facilities. The applicants are notified by IAEA of their fellowship's acceptance by State and placement at institutes in the United States.

Once the foreign candidates confirm their acceptance, IAEA instructs them to apply for a U.S. nonimmigrant visa. State's Bureau of Consular Affairs handles the adjudication of these visa applications, and in some cases, the consular officers will request a security advisory opinion, known as a Visas Mantis, if there are concerns that a visa applicant may

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engage in the illegal transfer of sensitive technology.<sup>20</sup> According to State, the key role of the Visas Mantis process is to protect U.S. national security, particularly in combating the proliferation of weapons of mass destruction, their delivery systems, and conventional weapons.<sup>21</sup>

Data provided to us by State indicated that 1,022 TC program fellows have studied nuclear issues at universities and other organizations in the United States from 1997 through 2007. In our review of this data, we found that 23 of the 1,022 fellows were from countries that were not NPT member states, such as Israel and Pakistan, or were from U.S.-designated state sponsors of terrorism, such as Syria. The fields of study pursued by these fellows included entomology, soil and plant science, analytical nuclear physics, and nuclear medicine.

We questioned State and Argonne National Laboratory officials to clarify the guidance and criteria State's Office of Multilateral Nuclear and Security Affairs uses to approve TC fellowship applicants for the study of nuclear issues in the United States. State officials told us that there is no formal policy or set of criteria they use to accept or reject TC fellowship requests on the basis of an applicant's country of origin. However, in response to our inquiry, State prepared a written description of the informal guidelines and preferences it uses to evaluate fellowship requests. According to this description, individuals from countries that have not signed the NPT are not eligible to pursue TC fellowships in the United States, although fellows from Israel and Pakistan were accepted by the United States as recently as 2002. Individuals from countries that have signed the NPT, however, may still "be excluded on the basis of such things as institutional affiliation or previous history or other political factors such as human rights concerns in such countries."

The lack of a formal State policy or guidance on this matter has led to differing views among U.S. officials about the countries of origin from which State will approve TC fellows. For instance, Argonne National Laboratory officials told us that they believed State's policy was to exclude

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<sup>20</sup>Under the Immigration and Nationality Act, an applicant is rendered inadmissible if a consular officer knows or has reason to believe that the applicant seeks to enter the United States to violate any law prohibiting the export of goods, technology, or sensitive information from the United States. 8 U.S.C. § 1182(a)(3)(A)(i)(II).

<sup>21</sup>For further information on the visa adjudication process and Visas Mantis, see GAO, *Border Security: Improvements Needed to Reduce Time Taken to Adjudicate Visas for Science Students and Scholars*, [GAO-04-371](#) (Washington, D.C.: Feb. 25, 2004).



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fellows from any country the United States had designated as a state sponsor of terrorism. However, the description prepared for us by State does not explicitly prohibit fellows from such countries. The most recent TC program fellow to study nuclear issues in the United States from one of the U.S.-designated state sponsors of terrorism—Syria—was in 2001.

In addition, the broad nature of the criteria to exclude fellows—including “other political factors” in their home countries—could leave fellowship decisions open to State officials’ subjective interpretation. For example, State officials told us that one country in Asia would no longer be permitted to send TC fellows to the United States because it is considered a wealthy, high-income nation, even though the description of the informal guidelines provided to us by State do not indicate that economic conditions in a TC fellow’s home country are a basis for rejection.

With regard to IAEA’s management of TC fellows, the agency does not have a policy to exclude individuals from certain countries from participating in the TC fellowship program, including individuals from nations about which the United States has terrorism or proliferation concerns. For example, in 2007, IAEA approved 48 fellows and scientific visitors from Cuba, 12 from Iran, 36 from Syria, and 30 from Sudan.<sup>22</sup> IAEA’s data did not indicate the countries and institutes where these fellows and scientific visitors pursued their studies.

We also found shortcomings in IAEA oversight of TC fellowships for potential proliferation concerns—specifically in detecting the possible involvement of former TC fellows in weapons-related research activities after they completed their studies abroad. IAEA officials told us that the agency does not have a systematic process for tracking the status, whereabouts, and activities of former TC fellows to determine, for example, if they remain involved in research related to their TC project, changed institutes, or have immigrated to other countries.

In 2005, however, IAEA officials surveyed fellows from 2001 and 2002 to determine their current activities and their views on the quality and impact of the fellowship program. IAEA followed up with a more in-depth survey of a sample of former fellows from seven countries. IAEA officials told us that they hope to conduct more analysis of former TC fellows, primarily to

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<sup>22</sup>In data IAEA provided to us, the numbers of TC fellows and scientific visitors were not counted separately.

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facilitate networking between former fellows and establish lessons learned for improved implementation of the program, not to determine whether former TC fellows could be involved in nuclear weapons efforts.

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## Long-Term TC Program Effectiveness Is Limited by Outdated Program Metrics, Financial Resource Constraints, and Sustainability Concerns

IAEA faces several limitations in effectively managing the TC program. Specifically, IAEA has not been able to accurately portray the TC program's achievements in meeting the development and other needs of member states in a meaningful way because it has not updated and revised the metrics for assessing program results. In addition, the program's impact is limited by financial resource constraints, including the failure of many member states to pay their full share of support to the TCF. Finally, the TC program's long-term effectiveness could be undermined by shortcomings in IAEA efforts to monitor how TC projects have been sustained and in recent efforts to sustain the TC program overall by reaching out to new partners and donors.

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## IAEA Lacks Adequate Metrics to Fully Assess TC Program's Impact

The goal of the TC program is to help member states achieve their sustainable development needs through the peaceful application of nuclear energy. However, IAEA has not updated and revised TC program performance metrics so that it can more accurately track and assess the program's overall impact in meeting member states' needs. Under a 2002 TC program strategy, IAEA established four strategic objectives and 12 performance metrics to assess program performance between 2002 and 2007. These four objectives were (1) establishing greater linkages between TC projects and national development plans and greater government commitment and support to projects; (2) expanding strategic partnerships to improve the TC program's visibility in resolving development problems; (3) increasing the level of funding for technical cooperation activities; and (4) strengthening the capacity of institutions in member states using nuclear technologies to become more technically and financially self-reliant. The 12 program performance metrics included having TC projects create an unspecified number of new partnerships with development organizations and having an increasing number of member states pay their full target share of funding to the TCF.

IAEA officials declined to provide us with detailed information explaining how these performance indicators were established or data substantiating how they were met. However, according to the TC program's 2006 annual report summarizing the program's progress against each indicator, IAEA met or exceeded 6 of the 12 performance indicators, did not meet 1, could

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not measure 1, and did not provide any assessment information on the remaining 4 performance goals.

The metrics developed for the program in 2002 are not meaningful indicators of program results and, therefore, do not provide sufficient information on the program's progress in meeting the sustainable development and related needs of member states. For example, the performance metric on member state contributions to the TCF conveys information on program management but does not measure fulfillment of member state needs, such as the number of additional cancer patients treated or the number of new nuclear safety regulations promulgated. Similarly, in its 2007 evaluation of TC activities, IAEA's internal auditor—the Office of Internal Oversight Services—found that the TC program lacks a robust, consistent process for assessing the effectiveness of TC projects, particularly after projects are completed.

IAEA officials acknowledged these weaknesses in the 2002 metrics, recognized they were out of date, and said that they wanted to develop more effective results-based metrics. However, to date, the TC program has not developed new program objectives or performance measures. The officials noted that a new TC information technology system—the Program Cycle Management Framework—to plan, implement, monitor, and report on TC projects will eventually collect information to assess project results against specific goals and metrics. In addition, according to the 2009-2011 TC program guidelines, the program needs to operate under results-based management principles and emphasize the importance of having program objectives and outcomes be linked to performance metrics to help measure progress in achieving results in technical cooperation.

IAEA officials told us that implementing a system of results-based metrics for the TC program faces challenges—particularly in obtaining reliable baseline information from member states about the scope of the problems or needs they hope to address by participating in the TC program. Without such information, they told us, IAEA cannot establish reliable long-term performance targets. For example, according to a 2007 evaluation by IAEA's internal auditor, almost half of the project performance metrics in the sample of projects it reviewed were not supported with baseline information and half did not indicate target values.

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## Many Member States Do Not Provide Financial Contributions to the TCF and Some High-Income Countries Receive TC Assistance

We found that the TC program faces financial constraints and limitations due to, among other things, shortfalls in member state payments to the TCF and high-income nations receiving TC support. IAEA officials told us that the TC program is underfunded, while IAEA's Director General has commented that program resources are insufficient to keep pace with country requests for support. Although the size of the TCF and overall level of funding paid by member states have increased in recent years,<sup>23</sup> many countries that receive TC assistance still do not pay their full share of support to the TCF that IAEA expects them to contribute. Specifically, the TCF experienced a funding shortfall in 2007 of \$3.5 million, or 4 percent, of the \$80 million total target budget because 62 member states did not pay their full contributions. Of these 62 countries, 47 states made no payment at all.<sup>24</sup> Appendix IV lists member states and the amounts they contributed to the TCF in 2007.

In addition, 13 member states that the UN defined as high-income countries in 2007—including Israel, Portugal, and Saudi Arabia—received a total of approximately \$3.8 million in assistance from the program, or 4 percent of the \$93.3 million in total TC disbursements that year. Recognizing that the emphasis of the TC program is on providing nuclear assistance to developing countries, IAEA officials told us that it would be helpful if more developed countries shifted from TC recipients to donors, which could allow the program to provide greater support to developing countries. For example, they stated that some member states have helped ease budget pressures within the TC program by voluntarily reducing the assistance they receive and gradually becoming donors. However, IAEA has not sought to formulate guidelines or criteria for determining when countries should be graduated from further TC assistance, and IAEA officials have not reached a consensus on how to pursue this matter. According to the Deputy Director General for the TC program, IAEA does not seek to retire specific countries from TC support regardless of their financial or development status. Nevertheless, other IAEA officials told us that determining program graduation criteria is a good idea. Appendix II identifies the countries designated by the United Nations in 2007 as high-income and the amount of TCF assistance they received that year.

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<sup>23</sup>The size of the TCF increased from approximately \$56.4 million in 2003 to \$76.5 million in 2007. The rate of total payment of member state contributions to the TCF rose from 75 percent of the overall TCF target in 2003 to 96 percent in 2007.

<sup>24</sup>The United States contributes 99 percent of its TCF target amount on an annual basis because of the proportionate share of funding it withholds for TC projects in Cuba.

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In addition, IAEA officials told us that broader issues should be considered in graduating high-income or highly-developed countries from TC assistance. Specifically, IAEA officials said that developed nations with more experience on nuclear issues could play a helpful role in providing nuclear expertise to less-developed nations in the same region. According to IAEA officials, this could entail reducing national-level TC project support to developed member states while continuing to provide support to them through regional projects. These officials also asserted that graduating states is complicated because the benefits provided by TC assistance keep countries involved in IAEA, including the safeguards program.

State and U.S. Mission officials told us that State does not have an official position on graduating member states from TC assistance. However, these officials said the idea merited consideration and suggested some countries whose economic wherewithal and level of nuclear development could justify graduation, including Brazil, China, Russia, and South Korea.

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## IAEA Faces Challenges Sustaining the TC Program

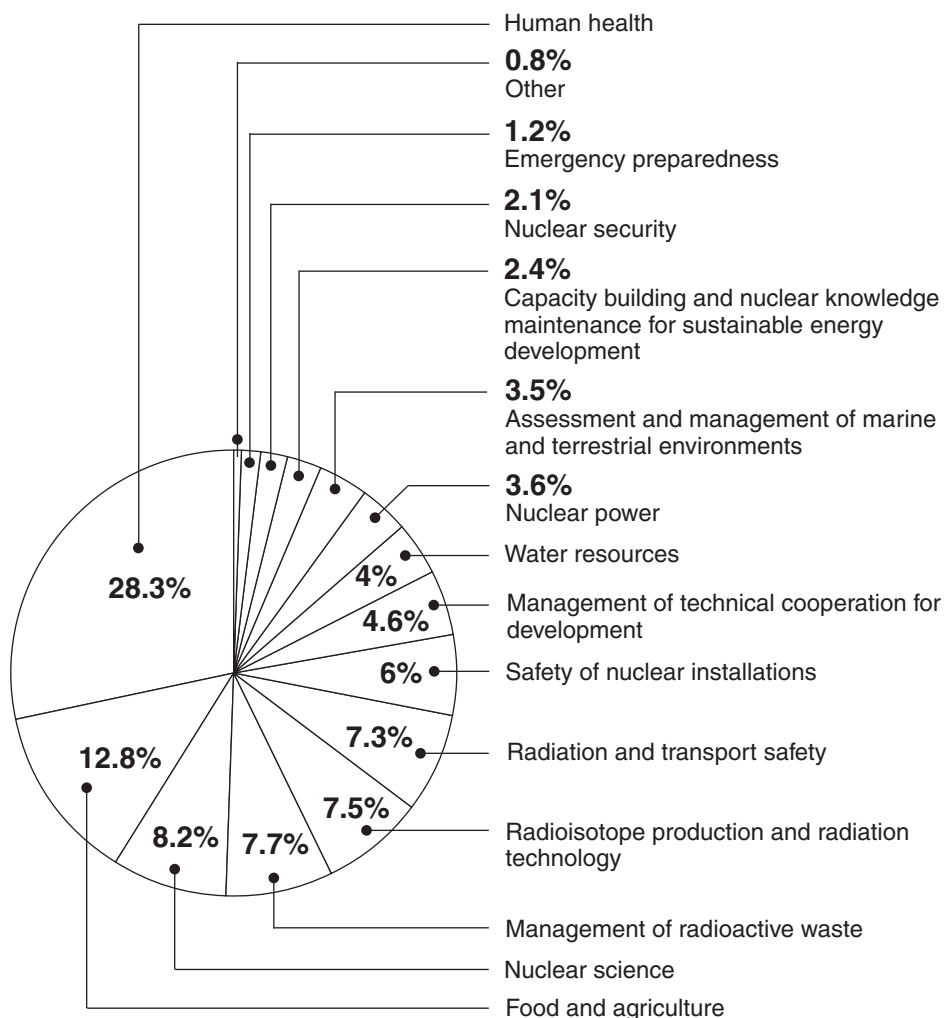
IAEA efforts to sustain TC project results and the TC program overall face several significant limitations and challenges. First, at the project level, IAEA does not conduct systematic follow-up to verify that member states are sustaining the results and activities of completed TC projects. IAEA's goal in providing technical cooperation is to help countries become technically and financially self-reliant so that they do not require future IAEA assistance to sustain peaceful nuclear skills and technologies. The Deputy Director General of the TC program stated that achieving sustainability hinges on having member states commit adequate financial support, infrastructure, and personnel once the project is completed.

IAEA officials told us that the program does assess sustainability potential of projects in the proposal development phase. As projects are being developed, IAEA uses a planning tool, known as a "country programme framework," to evaluate how TC project proposals contribute to the host country's national development priorities and to assess the host government's likely commitment to the project. However, we found that IAEA does not systematically review completed TC projects to verify whether the project results are being sustained by the recipient country, through government or other support. For example, the TC program does not conduct any assessments 2, 3, or 5 years past project completion, to see whether and how a country is maintaining established TC nuclear technologies and related skills.

Second, IAEA faces challenges in sustaining the TC program over the long term because TC funding is distributed across 18 different technical

areas—including nuclear power, nuclear security, food and agriculture, water resources, and human health—making it difficult for IAEA to set clear TC program priorities and to maximize the impact of limited program resources. Appendix V provides a complete list of all the technical areas to which TC program funding was allocated in 2007. Figure 1 shows the percentage of funds disbursed by project area.

**Figure 1: TC Program Disbursements, by Technical Area, 2007**



Source: GAO analysis of IAEA data.

Note: Percentages based on total 2007 TC disbursements of \$93,316,600. The "Other" category represents four separate technical areas: nuclear fuel cycle and materials technologies; safeguards; public information and communication; and executive management, policy making and coordination.

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According to U.S. Mission officials, this allocation of TC funding across multiple technical areas and the absence of clear program priorities reduces overall program effectiveness. U.S. Mission officials told us that IAEA should work to consolidate these areas and identify four or five future TC program priorities. IAEA officials agreed, but told us that they have little flexibility to set TC program priorities because they must be responsive to member state needs which vary across countries and regions. Nevertheless, TC program officials said they are attempting to promote priority-setting at the project level—for example, by limiting the number of projects member states were permitted to submit in 2008, and by moving away from funding mature nuclear technologies that no longer require development or in which member states have acquired sufficient capability to sustain on their own.

In addition, in 2007, IAEA initiated a fundamental review of the challenges and opportunities facing its programs to 2020 and beyond. As part of this review, IAEA's Secretariat identified priorities for the TC program and other IAEA programs. IAEA also convened a Commission of Eminent Persons to provide recommendations on the future role and activities of the agency, including the TC program. In its background report to the commission, IAEA identified future TC priorities in three main areas—disease prevention and control, food safety and security, and sustainable management of natural resources and ecosystems—with a lesser focus on a fourth area, industrial process management. However, IAEA officials told us that the restructuring of TC priorities and implementing other recommendations from this review would be contingent on the Board of Governors' approval.

Finally, IAEA officials told us that meeting member states' future demands for TC assistance—especially as interest in nuclear power grows—will strain program resources and pose a fundamental long-term sustainability challenge. As a result, IAEA is developing outreach strategies and has created an outreach team to attract the support and involvement of donor organizations and new partners—such as the UN Development Program—in the TC program. However, this effort faces several limitations and shortcomings.

The TC program outreach effort is narrowly focused on attracting donors and partners involved in international economic and social development. Although TC program guidance encourages private sector partnerships, IAEA officials told us that the new partner outreach effort will not extend to the private sector because they believed the level of effort to establish such partnerships would outweigh the expected benefits. Furthermore,

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while IAEA's internal auditors have reported on cases where member states successfully obtained private sector support to sustain TC projects—thus alleviating the need for further support from IAEA or the host government—IAEA officials told us that the TC program does not systematically assess TC proposals with respect to their commercial potential. IAEA officials told us that member states are not required to submit information in their TC proposals—such as a market analysis, a summary of business plans, or potential private sector investors in project activities—that IAEA could use to evaluate the long-term commercial prospects of a TC project.

The TC program's strategy of focusing its outreach primarily on international development organizations carries risks because IAEA is not well recognized as a development organization within the broader development community. According to the Deputy Director General of the TC Department, the development community largely perceives IAEA as a nuclear enforcement body and its development contributions are overlooked or unknown. In addition, some of the previous partnerships the TC program has built with international development organizations have been called into question. For example, a 2007 independent evaluation of the UN's Food and Agriculture Organization (FAO) concluded that FAO's long-standing partnership with IAEA on the use of nuclear techniques in food and agriculture has ceased to yield a high return on investment and, therefore, recommended that FAO withdraw future funding from the joint FAO-IAEA unit. Furthermore, according to the U.S. representative to the Standing Advisory Group on Technical Assistance and Cooperation, the TC program faces difficulties in building relationships with development organizations at the project and country levels because it does not have a presence in the host countries to promote the program. For example, this representative told us that the national liaison officers—who serve as intermediaries on TC projects between IAEA and the host governments and collaborating institutes—tend to be technical specialists who do not understand their country's development needs, do not network with other development organizations, and are not involved in the governmental processes that set national development plans and priorities.

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## Conclusions

The world today is dramatically different than when IAEA was created over 50 years ago. Therefore, certain IAEA policies related to the TC program, as well as the rights, expectations, and obligations of IAEA member states that are beneficiaries of the program, merit careful consideration and, as appropriate, re-examination. In our view, TC



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proposals should not be evaluated simply on their technical merits in isolation from political considerations concerning the countries making the requests, particularly since the assistance in question involves supplying nuclear equipment, training, and expertise, some of which is dual-use in nature. In that regard, we believe that State's policy of not encouraging IAEA to systematically limit TC projects in countries that are U.S.-designated state sponsors of terrorism communicates a mixed message on the acceptability of transferring nuclear technologies and expertise to countries the United States has deemed inherently dangerous.

We recognize that the TC program provides IAEA member states that are developing countries with many benefits and that not every project funded by the program poses a proliferation risk. However, the United States does not have the necessary information available on a timely basis to make sound judgments about the proliferation risks of many of these projects, particularly in the project proposal development phase. A better system, with more complete and timely data provided by IAEA, would help ensure that projects are fully and appropriately vetted by U.S. agencies and those that pose a potential proliferation risk are identified early in the project development process. Until that happens, we will continue to have concerns about the potential proliferation risks posed by TC projects, particularly those linked to countries of concern.

With greater transparency and earlier information from IAEA on TC project proposals, the United States government and other countries could raise and address proliferation concerns with IAEA's Secretariat before it endorses projects for approval by the Board of Governors. We are also concerned by IAEA's refusal to share information with the United States and other member states on findings from its internal proliferation reviews of TC projects. Furthermore, deficiencies in State's record-keeping on TC program matters is troubling because we could not determine what, if any, actions State took to address concerns identified by DOE and the national laboratories.

Regarding TC fellowships, State has not established a formal policy governing the approval of TC fellows from foreign countries interested in studying nuclear issues in the United States. The absence of such a policy has allowed individuals from non-NPT countries and individuals from countries that are U.S.-designated state sponsors of terrorism who obtain visas to study in the United States and potentially acquire valuable information. We also believe IAEA should take steps to improve monitoring of individuals who have completed fellowships, to track their whereabouts and ongoing research, and to determine if the knowledge and

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information they obtained on TC projects is being applied to strictly peaceful purposes.

Regarding our management concerns associated with the TC program, we believe that all member states receiving TC support should provide their full contribution to the TCF. We also question the need to provide TC assistance to high-income countries that have the apparent economic means to finance their nuclear research and development needs independently. In our view, IAEA could enhance the impact of its limited resources by developing and applying reasonable “means testing” criteria in future allocation of TC funding and consider ways in which high-income countries can be graduated from continued TC assistance. In addition, the metrics IAEA has used to track TC program performance do not provide the United States and other member states with sufficient information on the TC program’s overall value. Development of more meaningful results-based performance measures could allow IAEA to more effectively demonstrate the TC program’s impact.

Finally, IAEA could enhance the impact of the TC program’s limited resources by formally setting priorities for future TC funding, as well as identifying areas that are less urgent because of the availability of mature nuclear technologies and other donors. In terms of IAEA’s outreach to potential new TC donors, we believe that the private sector could be a crucial partner in supporting the TC program generally and in sustaining the results of TC projects so that member states can become technically and financially less dependent on IAEA. In our view, IAEA should also assess TC proposals not only for technical feasibility and host government support, but also for potential private sector support to sustain project activities and results.

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## Matter for Congressional Consideration

If Congress wishes to make known that the United States does not support IAEA’s policy of permitting TC projects in countries that State has designated as state sponsors of terrorism, or other countries where other concerns persist, it could explicitly require—as it currently does with Cuba and has done in the past with Iran, Libya, and the Territories Under the Jurisdiction of the Palestinian Authority—that State withhold a proportionate share of the U.S. voluntary contribution to the TC program that is equivalent to the amounts of TCF funding that would otherwise be made available to these countries. Alternatively, if Congress wishes to obtain additional information before making this decision, it could require State to report to Congress explaining its rationale for not withholding a

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proportionate share of the U.S. contribution to the TCF for U.S.-designated state sponsors of terrorism.

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## Recommendations for Executive Action

To address the range of proliferation and management concerns related to the TC program, we recommend that the Secretary of State, working with IAEA and member states through the Board of Governors, explore undertaking the following eight actions:

- Establish a formal mechanism to facilitate greater and more timely information sharing on TC project proposals between IAEA and the United States and other countries—including detailed information on the TC proposals themselves, as well as the results of IAEA’s internal proliferation reviews of the proposals—so that proliferation and other concerns can be identified and addressed early in the project development cycle.
- Promote a regular and systematic process for obtaining, retaining, and updating information on prior TC project fellows to better track where and how the knowledge and expertise they have obtained is being applied.
- Strengthen the TC program’s mechanisms for collecting member states’ contributions to the TCF to include withholding from nonpaying states a percentage of TC assistance equivalent to the percentage of their target rate that they fail to contribute to the TCF.
- Establish criteria for determining when member states, especially those defined as high-income countries, no longer need TC assistance in particular fields and when such states could be graduated from further TC support altogether.
- Seek to implement new results-based performance metrics for the TC program that establish specific national, regional, and interregional social and economic needs and measure the collective impact of TC projects in meeting those objectives.
- Focus the TC program on a more limited number of high-priority technical areas to maximize the impact of program resources.
- Encourage the TC program to reach out to private sector entities as part of its new partner and donor development strategy.
- Request member states to assess in their TC project proposals the prospects for commercialization of and private sector investment in the results of the projects. Such steps could include requiring information in the proposals on potential business plans, marketing strategies, and strategies for attracting commercial partners once IAEA support has concluded.

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Finally, to clarify and improve U.S. oversight of the TC program, we recommend that the Secretary of State undertake the following two actions:

- Enhance record-keeping and formally document management actions regarding the discussion, action, and disposition of TC project proposals that DOE and the national laboratories identify as having potential proliferation concerns.
- Issue formal guidance with well-defined criteria—such as countries designated by State as sponsors of terrorism or gross human rights violators—that State should use as the basis for approving or rejecting TC fellowship requests for nuclear studies in the United States. This guidance could include, among other things, a list of specific countries from which State would not approve TC fellows that could be updated and revised annually, or as other circumstances warrant.

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## Agency Comments and Our Evaluation

We provided a draft of this report to State and DOE for formal comment. We also provided IAEA with a detailed summary of facts contained in the draft report. State provided written comments on the draft report, which are presented in appendix VI. DOE and IAEA provided technical comments that we incorporated as appropriate.

State strongly opposed the matter for congressional consideration to require State to withhold a proportionate share of the U.S. voluntary contribution to the TC program that is equivalent to the amounts of TCF funding that would otherwise be made available to U.S.-designated state sponsors of terrorism and or other countries of concern. State objected for a number of reasons, contending that (1) it would be counterproductive to a separate recommendation we made in the report encouraging all states to pay their full share to the TCF; (2) it would not stop TC projects in targeted countries because TCF funding is fungible; (3) Congress has exempted IAEA contributions from this type of proportionate withholding; (4) none of the TC projects in state sponsors of terrorism have been shown to have contributed to a WMD program; (5) there are adequate safeguards within IAEA's Secretariat to prevent TC projects from contributing to a WMD program; and (6) it would negatively impact the ability of the United States to achieve other critical objectives within IAEA.

We do not believe the matter for congressional consideration is unique or unprecedented. As we noted in our report, U.S. law currently requires the withholding of a proportionate share of the U.S. contribution to the TCF

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for certain projects in Cuba, and has required withholding in the past for Iran, Libya, and the Territories Under the Jurisdiction of the Palestinian Authority. However, in order to give Congress greater flexibility and more information, we have broadened the matter for congressional consideration to give Congress the option of requiring State to report on its rationale for not withholding a proportionate share of the U.S. contribution to the TCF for U.S.-designated state sponsors of terrorism.

Notwithstanding our modification to the matter for congressional consideration, we still disagree with State's specific objections to it for the following reasons:

- We do not believe the matter for congressional consideration is counterproductive to our recommendation to strengthen mechanisms for collecting member state contributions to the TCF. That recommendation is geared toward strengthening mechanisms for collecting contributions to the TCF from member states that are receiving TC assistance. The United States is the largest donor to the TC program, providing approximately 25 percent of the TCF annual budget, and is not a beneficiary of TC assistance.
- While contributions to the TCF are fungible, we believe there is a fundamental principle at stake. As we described in our report, the United States has applied several types of sanctions limiting foreign assistance and trade to states it has designated as sponsors of terrorism and to other countries. To avoid the appearance of an inconsistent approach and to foster greater cohesion in U.S. policy toward such nations, we believe that it is fair for Congress to consider requiring State to withhold a share of the U.S. contribution to the TCF for program activities in countries that the United States chooses not to engage directly in trade, assistance, and other forms of cooperation.
- We are aware that in 1994 U.S. contributions to IAEA were exempted from the law requiring State to withhold proportionate shares of funding to international organizations for programs in certain countries. However, we note that the IAEA exemption was enacted in 1994. In our view, the proliferation concerns about some countries receiving TC assistance—such as Iran and Syria—have increased rather than diminished since that time. Furthermore, we note that since the enactment of the 1994 exemption, the law has been further amended to require State to withhold a proportionate share of funding to IAEA for certain projects in Cuba and for all projects in Iran if State determines that such projects in Iran are inconsistent with U.S. nuclear nonproliferation and safety goals, will provide Iran with training or expertise relevant to the development of

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nuclear weapons, or are being used as a cover for the acquisition of sensitive nuclear technology.

- We do not believe that State can assert with confidence that TC projects have not contributed to WMD programs in state sponsors of terrorism. The absence of evidence showing that TC projects have assisted nuclear weapons development in U.S.-designated state sponsors of terrorism does not, in our view, constitute proof that such countries have not exploited TC assistance to advance possible weapons development skills and activities. Based on findings in our report—including the limited information available to DOE and the national laboratories on TC projects and the inherent dual-use nature of some nuclear expertise and technology—we believe it is difficult to say with confidence that TC projects are not contributing indirectly to weapons-related knowledge and expertise in such countries.
- We do not have the same level of confidence as State in the safeguards within IAEA's Secretariat to prevent TC projects from contributing to weapons development. As we stated in the report, we were unable to assess the effectiveness of IAEA's internal process for reviewing TC proposals and projects for proliferation concerns because IAEA's Secretariat declined to provide us with basic information and documentation regarding the results of its reviews. Furthermore, as described in the report, IAEA's Secretariat approved at least one TC project proposal—involving the Iranian heavy water reactor at Arak—that State later objected to.
- Finally, neither we nor State can conclude with certainty how other states might react to an increase in the United States' proportionate withholding of funding to the TCF and how this would affect U.S. ability to achieve other objectives within the agency.

State agreed with 7 of our 10 recommendations to improve TC program management and oversight. It neither agreed nor disagreed with the three other recommendations that called on State, working with IAEA and member states through the Board of Governors, to explore (1) establishing a formal mechanism to facilitate greater and more timely information sharing on TC proposals between IAEA, the United States, and other countries; (2) strengthening TC program mechanisms for collecting member state contributions to the TCF, including withholding a percentage of TC assistance to recipient countries that fail to pay their target contribution; and (3) establishing criteria for determining when member states no longer require TC assistance and could be graduated from further TC support.

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Regarding the recommendation concerning the establishment of a formal mechanism to facilitate greater and more timely information sharing on TC project proposals between IAEA and the United States and other countries, State noted that it would be difficult to implement through IAEA's Board of Governors because TC proposals are considered confidential between IAEA and the recipient state. State commented that a more achievable goal could be to work with IAEA to ensure that it publishes a complete listing of project proposals earlier. Because TC projects can involve transfer of equipment, technology, and expertise that could potentially contribute to nuclear weapons development, we continue to believe that TC proposals demand the highest level of scrutiny, transparency, and information sharing. We question why details of TC proposals are considered confidential, and believe the United States and other major donors should have a full understanding of the proposals that they are being asked to support through their TCF contributions. Finally, as noted in the report, we found that the quantity of information about TC proposals currently available to DOE and the national laboratories is insufficient in many cases—especially in cases where DOE and the national laboratories obtained only lists of proposal titles—to make accurate determinations of potential proliferation risks. It is unclear whether State's suggestion to work with IAEA to publish the complete listing of proposed projects earlier would result in sufficient details being provided to DOE and the national laboratories to allow them to more reliably assess proliferation risks.

On our recommendation to strengthen the mechanisms for collecting member state contributions to the TCF, State commented that the rate of payment to the TCF by member states has improved in recent years. However, as we noted in the report, many states receiving assistance are still not paying their full share of contributions to the TCF. We believe there is room for continued improvement and that mechanisms should continue to be strengthened toward that end. We believe the recommendation is sound and should be implemented.

Finally, concerning the recommendation to establish criteria for determining when member states no longer require further TC assistance and could be graduated from further TC support, State observed that a proposal for graduating higher-income TC recipient states based on their per capita gross national product was put forward in 1997. State noted that one member state objected to graduating countries based solely on such criteria. We recognize the political and practical challenges of implementing a graduation strategy for member states receiving TC assistance. However, as noted in our report, both State and IAEA officials

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supported the principle of graduating countries that no longer require TC assistance. Moreover, our recommendation does not identify specific graduation criteria or specify that a member state's income ranking be the sole factor to serve as the basis for graduating a state from further TC support.

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As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to interested congressional committees and Members of Congress, the Secretary of State, and the Secretary of Energy. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or [aloisee@gao.gov](mailto:aloisee@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VII.

Sincerely yours,

A handwritten signature in black ink that reads "Gene Aloise". The signature is written in a cursive, flowing style with a large initial "G".

Gene Aloise  
Director, Natural Resources and Environment



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# Appendix I: Objectives, Scope, and Methodology

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To review the International Atomic Energy Agency's (IAEA) Technical Cooperation (TC) program we assessed the (1) extent to which the United States and IAEA have policies limiting member states' participation in the TC program on the basis of nuclear proliferation and related concerns; (2) extent to which the United States and IAEA evaluate and monitor TC projects for proliferation concerns; and (3) limitations and challenges in IAEA's management of the TC program. We employed several methodologies to address these objectives.

Our review of the TC program covered the years 1997 through 2007. We chose this period because our previous report on the TC program reported on TC programmatic and financial data through 1996. We interviewed key officials and analyzed documentation, such as cables, presentations, financial information, and reports and analyses of TC program issues from the Departments of State (State) and Energy (DOE). State officials also provided us with relevant IAEA documentation and information, such as copies of IAEA's annual "white books" identifying TC projects approved by IAEA, as well as information on specific TC projects from IAEA's "TC-PRIDE" database. We also interviewed officials in the Nuclear Regulatory Commission's Office of International Programs who participate in U.S. interagency meetings on IAEA TC issues. In addition, we met with representatives from five national laboratories involved in the DOE Interdiction Technical Analysis Group, a multilaboratory team providing DOE with technical analysis of proliferation-related issues, including the TC program. We also visited the Oak Ridge National Laboratory (ORNL) to obtain documentation and interview current and former ORNL staff involved in previous and ongoing assessments of TC proposals and active projects for potential proliferation concerns. In addition, we visited the Argonne National Laboratory to interview representatives who provide support and analytical services to State on TC issues, organize training seminars for foreign nationals involved in TC projects, and facilitate TC fellowships for foreign nationals to study nuclear issues in the United States.

We also interviewed officials at IAEA headquarters in Vienna, Austria, including representatives from the TC Department and other IAEA departments, including the Departments of Management, Safeguards, and Nuclear Safety and Security; the Office of Internal Oversight Services; and the Office of External Relations and Policy Coordination. We reviewed and analyzed information provided by IAEA officials, including presentation slides, annual reports, internal and external auditor reports, and TC project brochures. We also reviewed speeches and other statements by IAEA officials on the TC program and related IAEA issues. IAEA officials

provided us with data on the number of TC projects by year, country, and technical area, as well as financial information on the TC program over the past decade. We interviewed knowledgeable IAEA officials on the reliability of these data, including issues such as data entry, access, quality control procedures, and the accuracy and completeness of the data. We determined that the data were sufficiently reliable for the purposes of this review.

Furthermore, we interviewed officials at the U.S. Mission to International Organizations in Vienna (U.S. Mission) regarding TC program policies and processes. We also met with officials from the Canadian Permanent Mission to the International Organizations in Vienna who work on IAEA issues to gain their perspectives on the TC program. We also conducted interviews with several nongovernmental experts who have monitored IAEA and developments in the TC program, and met with and obtained documentation from the U.S. representative to IAEA's Standing Advisory Group on Technical Assistance and Cooperation.

We discussed U.S. and IAEA policies and criteria with State and IAEA officials on the extent to which countries are limited from receiving TC assistance because of proliferation and related concerns. We also reviewed (1) speeches, articles, and other statements made by IAEA officials; (2) annual State reports to Congress on IAEA assistance provided to some states that the United States has identified as countries of concern; (3) speeches and statements by U.S. officials; and (4) cables between State and the U.S. Mission outlining U.S. policy toward the TC program. We obtained and analyzed the lists of countries that (1) are designated by the United States as state sponsors of terrorism, (2) are party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), and (3) have comprehensive safeguards agreements and additional protocols in force with IAEA. We cross-referenced each of these lists against IAEA financial records to determine how much TC support has been provided to countries that the United States has listed as state sponsors of terrorism, are not party to the NPT, or do not have comprehensive safeguards or additional protocol agreements in force with IAEA.

To assess the extent to which the United States and IAEA evaluate and monitor TC projects for proliferation concerns, we interviewed State and DOE officials regarding their TC program review processes. We also interviewed representatives from five of the U.S. national laboratories involved in past and current evaluations of TC proposals and projects for proliferation concerns. Through DOE, we obtained and analyzed

information from ORNL and Los Alamos National Laboratory (LANL) to determine the numbers of TC proposals the national laboratories reviewed each year between 1998 and 2006. We reviewed and verified these data with DOE and the national laboratory officials, and discussed and verified the proliferation risks DOE and the national laboratory officials identified in specific TC proposals. We used IAEA records of approved TC projects to determine whether TC proposals that the national laboratories had identified as having possible proliferation risks were approved by IAEA. Because of IAEA policies that restricted our access to data and related information on TC proposal and project reviews by IAEA's Safeguards Department, we were unable to assess the effectiveness of IAEA's internal review of TC proposals and projects for proliferation concerns.

To determine the challenges and limitations in IAEA's management of the TC program, we interviewed officials from State, Argonne National Laboratory, and IAEA, as well as the U.S. representative to IAEA's Standing Advisory Group on Technical Assistance and Cooperation. We obtained and reviewed relevant IAEA documentation addressing TC program metrics, such as TC program guidance and strategy documents, IAEA internal audit reports, and meeting reports by IAEA's Technical Assistance and Cooperation Committee. To assess financial resource challenges facing the TC program, we analyzed financial data from TC program annual reports between 1997 and 2007—including annual budgets of the Technical Cooperation Fund (TCF), annual contributions by member states to the TCF, and amounts of annual TC assistance provided to recipient countries and territories—to determine the level of funding countries contributed to the TCF and the amounts some countries received from the TC program over the past decade. We used the United Nation's (UN) annual Human Development Reports to determine country income classifications. For each country, we cross-referenced TC financial data against country income classifications to determine the amounts of funding countries designated by the UN as "high-income" contributed to and received from the TC program. Additionally, we reviewed TC program annual reports to determine the technical areas covered and funded by the program.

As initially agreed with your office, we intended to assess the extent to which TC projects have contributed to the safety and security of nuclear installations around the world. Toward that end, using data provided by State from IAEA's TC-PRIDE database, identifying all TC projects funded in the nuclear security and safety fields since 1997, we developed a judgmental sample of 22 TC projects (17 national projects and 5 regional projects) to serve as the basis for our assessment and interviews with

relevant IAEA officials. We selected this judgmental sample by focusing on projects completed since 2005. Using the data provided by State, we calculated the average cost of national-level nuclear security and safety projects completed since that time and selected the 17 projects that exceeded this average cost. The 5 regional projects in our judgmental sample were selected by identifying the highest budget project in each of the five TC program regions completed since 2005. We briefed IAEA officials on our project selection methodology, and they agreed that it was fair and unbiased. However, IAEA officials declined to make additional information available to us on these projects and did not provide us with an opportunity to interview relevant IAEA officials who oversaw these projects to discuss their impact and results. As a result of these restrictive policies, we were unable to sufficiently assess the TC program's contributions to improving the safety and security of nuclear facilities around the world.

We conducted this performance audit from December 2007 to March 2009, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: 2007 Technical Cooperation Assistance Recipient States and Territories

Dollars in thousands

Country	Total 2007 TC funding received	IAEA member state?	U.S.-designated state sponsor of terrorism?	NPT state party?	Comprehensive safeguards agreement in force?	Additional protocol in force?	2007 UN income category
<b>Africa region</b>							
Algeria	\$1,361.4	Yes	No	Yes	Yes	No	Middle
Angola	495.5	Yes	No	Yes	No	No	Middle
Benin	371.6	Yes	No	Yes	No	No	Low
Botswana	393.1	Yes	No	Yes	Yes	Yes	Middle
Burkina Faso	567.4	Yes	No	Yes	Yes	Yes	Low
Cameroon	412.3	Yes	No	Yes	Yes	No	Middle
Central African Republic	365.3	Yes	No	Yes	No	No	Low
Chad	143.3	Yes	No	Yes	No	No	Low
Côte d'Ivoire	253.8	Yes	No	Yes	Yes	No	Low
Democratic Republic of the Congo	699.1	Yes	No	Yes	Yes	Yes	Low
Egypt	1,280.9	Yes	No	Yes	Yes	No	Middle
Eritrea	242.2	Yes	No	Yes	No	No	Low
Ethiopia	2,187.5	Yes	No	Yes	Yes	No	Low
Gabon	159.1	Yes	No	Yes	No	No	Middle
Gambia	3.5	No	No	Yes	Yes	No	Low
Ghana	1,184.1	Yes	No	Yes	Yes	Yes	Low
Kenya	1,093.5	Yes	No	Yes	No	No	Low
Libyan Arab Jamahiriya	894.4	Yes	No	Yes	Yes	Yes	Middle
Madagascar	870.6	Yes	No	Yes	Yes	Yes	Low
Malawi	35.2	Yes	No	Yes	Yes	Yes	Low
Mali	1,021.9	Yes	No	Yes	Yes	Yes	Low
Islamic Republic of Mauritania	156.1	Yes	No	Yes	No	No	Low
Mauritius	368.9	Yes	No	Yes	Yes	Yes	Middle
Morocco	996.9	Yes	No	Yes	Yes	No	Middle
Mozambique	17.5	Yes	No	Yes	No	No	Low
Namibia	421.1	Yes	No	Yes	Yes	No	Middle
Niger	596.5	Yes	No	Yes	Yes	Yes	Low
Nigeria	1,527.0	Yes	No	Yes	Yes	Yes	Low
Senegal	983.9	Yes	No	Yes	Yes	No	Low
Seychelles	100.3	Yes	No	Yes	Yes	Yes	Middle

**Appendix II: 2007 Technical Cooperation  
Assistance Recipient States and Territories**

<b>Country</b>	<b>Total 2007 TC funding received</b>	<b>IAEA member state?</b>	<b>U.S.- designated state sponsor of terrorism?</b>	<b>NPT state party?</b>	<b>Comprehensive safeguards agreement in force?</b>	<b>Additional protocol in force?</b>	<b>2007 UN income category</b>
Sierra Leone	348.4	Yes	No	Yes	No	No	Low
South Africa	1,142.3	Yes	No	Yes	Yes	Yes	Middle
Sudan	1,148.1	Yes	Yes	Yes	Yes	No	Low
Tunisia	789.0	Yes	No	Yes	Yes	No	Middle
Uganda	689.3	Yes	No	Yes	Yes	Yes	Low
United Republic of Tanzania	1,925.3	Yes	No	Yes	Yes	Yes	Low
Zambia	618.3	Yes	No	Yes	Yes	No	Low
Zimbabwe	571.0	Yes	No	Yes	Yes	No	Low
<b>Subtotal, Africa</b>	<b>\$26,435.6</b>						
<b>Asia and the Pacific region</b>							
Afghanistan	111.3	Yes	No	Yes	Yes	Yes	Low
Bangladesh	1,130.4	Yes	No	Yes	Yes	Yes	Low
Brunei Darussalam	0.5	No	No	Yes	Yes	No	High
Burma (Myanmar)	670.4	Yes	No	Yes	Yes	No	Low
Cambodia	0.9	No	No	Yes	Yes	No	Low
China	2,007.1	Yes	No	Yes	<sup>a</sup>	Yes	Middle
India	252.8	Yes	No	No	No	No	Low
Indonesia	1,168.6	Yes	No	Yes	Yes	Yes	Middle
Islamic Republic of Iran	1,000.0	Yes	Yes	Yes	Yes	No	Middle
Iraq	190.6	Yes	No	Yes	Yes	No	Middle
Israel	251.6	Yes	No	No	No	No	High
Jordan	930.6	Yes	No	Yes	Yes	Yes	Middle
Republic of Korea	636.3	Yes	No	Yes	Yes	Yes	High
Kuwait	152.2	Yes	No	Yes	Yes	Yes	High
Lebanon	502.3	Yes	No	Yes	Yes	No	Middle
Malaysia	1,012.8	Yes	No	Yes	Yes	No	Middle
Marshall Islands	0.4	Yes	No	Yes	Yes	Yes	Middle
Mongolia	697.2	Yes	No	Yes	Yes	Yes	Low
Pakistan	2,233.9	Yes	No	No	No	No	Low
Philippines	1,510.7	Yes	No	Yes	Yes	No	Middle
Qatar	232.8	Yes	No	Yes	No <sup>b</sup>	No	High
Saudi Arabia	321.5	Yes	No	Yes	No <sup>c</sup>	No	High
Singapore	137.8	Yes	No	Yes	Yes	No <sup>d</sup>	High
Sri Lanka	810.8	Yes	No	Yes	Yes	No	Middle

**Appendix II: 2007 Technical Cooperation  
Assistance Recipient States and Territories**

<b>Country</b>	<b>Total 2007 TC funding received</b>	<b>IAEA member state?</b>	<b>U.S.- designated state sponsor of terrorism?</b>	<b>NPT state party?</b>	<b>Comprehensive safeguards agreement in force?</b>	<b>Additional protocol in force?</b>	<b>2007 UN income category</b>
Syrian Arab Republic	1,525.4	Yes	Yes	Yes	Yes	No	Middle
Territories Under the Jurisdiction of the Palestinian Authority	26.3	No	No	No	No	No	Middle
Thailand	1,057.4	Yes	No	Yes	Yes	No	Middle
United Arab Emirates	158.7	Yes	No	Yes	Yes	No	High
Vietnam	1,770.8	Yes	No	Yes	Yes	No	Low
Yemen	1,179.2	Yes	No	Yes	Yes	No	Low
<b>Subtotal, Asia and the Pacific</b>	<b>\$21,681.3</b>						
<b>Europe region</b>							
Albania	784.1	Yes	No	Yes	Yes	No	Middle
Armenia	1,308.7	Yes	No	Yes	Yes	Yes	Middle
Azerbaijan	312.1	Yes	No	Yes	Yes	Yes	Middle
Belarus	969.8	Yes	No	Yes	Yes	No	Middle
Bosnia and Herzegovina	399.2	Yes	No	Yes	Yes	No	Middle
Bulgaria	898.7	Yes	No	Yes	Yes	Yes	Middle
Croatia	1,141.6	Yes	No	Yes	Yes	Yes	Middle
Cyprus	140.5	Yes	No	Yes	Yes	Yes	High
Czech Republic	564.4	Yes	No	Yes	Yes	Yes	Middle
Estonia	808.9	Yes	No	Yes	Yes	Yes	Middle
Georgia	811.5	Yes	No	Yes	Yes	Yes	Middle
Greece	332.5	Yes	No	Yes	Yes	Yes	High
Hungary	389.4	Yes	No	Yes	Yes	Yes	Middle
Kazakhstan	1,303.1	Yes	No	Yes	Yes	Yes	Middle
Kyrgyzstan	542.6	Yes	No	Yes	Yes	No	Low
Latvia	247.3	Yes	No	Yes	Yes	Yes	Middle
Lithuania	2,607.0	Yes	No	Yes	Yes	Yes	Middle
Malta	405.7	Yes	No	Yes	Yes	Yes	High
Montenegro	18.9	Yes	No	Yes	No	No	Middle
Poland	1,553.8	Yes	No	Yes	Yes	Yes	Middle
Portugal	504.3	Yes	No	Yes	Yes	Yes	High
Republic of Moldova	905.4	Yes	No	Yes	Yes	No	Middle
Romania	1,276.5	Yes	No	Yes	Yes	Yes	Middle
Russian Federation	919.4	Yes	No	Yes	<sup>a</sup>	Yes	Middle
Serbia	2,129.4	Yes	No	Yes	Yes	No	Middle

**Appendix II: 2007 Technical Cooperation  
Assistance Recipient States and Territories**

<b>Country</b>	<b>Total 2007 TC funding received</b>	<b>IAEA member state?</b>	<b>U.S.- designated state sponsor of terrorism?</b>	<b>NPT state party?</b>	<b>Comprehensive safeguards agreement in force?</b>	<b>Additional protocol in force?</b>	<b>2007 UN income category</b>
Slovakia	628.3	Yes	No	Yes	Yes	Yes	Middle
Slovenia	481.3	Yes	No	Yes	Yes	Yes	High
Tajikistan	855.9	Yes	No	Yes	Yes	Yes	Low
The Former Yugoslav Republic of Macedonia	642.0	Yes	No	Yes	Yes	Yes	Middle
Turkey	466.7	Yes	No	Yes	Yes	Yes	Middle
Ukraine	2,466.2	Yes	No	Yes	Yes	Yes	Middle
Uzbekistan	1,015.4	Yes	No	Yes	Yes	Yes	Low
<b>Subtotal, Europe</b>	<b>\$27,830.6</b>						
<b>Latin America region</b>							
Argentina	1,543.2	Yes	No	Yes	Yes	No	Middle
Belize	61.4	Yes	No	Yes	Yes	No	Middle
Bolivia	817.4	Yes	No	Yes	Yes	No	Middle
Brazil	1,480.4	Yes	No	Yes	Yes	No	Middle
Chile	1,112.6	Yes	No	Yes	Yes	Yes	Middle
Colombia	778.0	Yes	No	Yes	Yes	No	Middle
Costa Rica	749.6	Yes	No	Yes	Yes	No	Middle
Cuba	1,323.7	Yes	Yes	Yes	Yes	Yes	Middle
Dominican Republic	256.9	Yes	No	Yes	Yes	No	Middle
Ecuador	849.1	Yes	No	Yes	Yes	Yes	Middle
El Salvador	531.9	Yes	No	Yes	Yes	Yes	Middle
Guatemala	435.6	Yes	No	Yes	Yes	No <sup>e</sup>	Middle
Haiti	450.1	Yes	No	Yes	Yes	Yes	Low
Honduras	394.5	Yes	No	Yes	Yes	No	Middle
Jamaica	298.4	Yes	No	Yes	Yes	Yes	Middle
Mexico	962.8	Yes	No	Yes	Yes	No	Middle
Nicaragua	1,516.3	Yes	No	Yes	Yes	Yes	Middle
Panama	549.4	Yes	No	Yes	Yes	Yes	Middle
Paraguay	384.3	Yes	No	Yes	Yes	Yes	Middle
Peru	670.8	Yes	No	Yes	Yes	Yes	Middle
Uruguay	655.6	Yes	No	Yes	Yes	Yes	Middle
Venezuela	681.3	Yes	No	Yes	Yes	No	Middle
<b>Subtotal, Latin America</b>	<b>\$16,503.3</b>						



**Appendix II: 2007 Technical Cooperation  
Assistance Recipient States and Territories**

<b>Country</b>	<b>Total 2007 TC funding received</b>	<b>IAEA member state?</b>	<b>U.S.- designated state sponsor of terrorism?</b>	<b>NPT state party?</b>	<b>Comprehensive safeguards agreement in force?</b>	<b>Additional protocol in force?</b>	<b>2007 UN income category</b>
<b>Interregional and global TC funding</b>							
Interregional	24.3						
Global	842.6						
<b>Subtotal, Interregional and Global</b>	<b>\$866.9</b>						
<b>Total</b>	<b>\$93,317.7</b>						

Source: GAO analysis of State, IAEA, and UN data.

<sup>a</sup>As nuclear-weapon states, China and Russia are not obligated under the NPT to accept comprehensive safeguards on their nuclear activities.

<sup>b</sup>Qatar brought a comprehensive safeguards agreement into force in January 2009.

<sup>c</sup>Saudi Arabia brought a comprehensive safeguards agreement into force in January 2009.

<sup>d</sup>Singapore brought an additional protocol into force in March 2008.

<sup>e</sup>Guatemala brought an additional protocol into force in May 2008.

# Appendix III: Numbers of Technical Cooperation Proposals Reviewed by U.S. National Laboratories, Categorized by Level of Proliferation Risk, by Year, 1998 through 2006

National laboratory assessment of TC proposal proliferation risks												
		Number of proposals reviewed, title only review					Number of proposals reviewed, additional information obtained					
Review year	Lead reviewer	No concern	Some concern but insufficient data to assess	Low, minimal concern	Medium, moderate concern	High concern	No concern	Some concern but insufficient data to assess	Low, minimal concern	Medium, moderate concern	High concern	
1998	ORNL	3	0	0	0	0	12	0	3	2	0	
2000	ORNL	270	2	0	0	0	1	1	6	1	0	
2002	ORNL	86	0	0	0	0	1	1	1	0	0	
2004	ORNL	478	1	0	0	0	12	1	2	1	1	
2006	LANL	659	20	0	0	0	0	0	0	0	0	
<b>Total</b>		<b>1,496</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>3</b>	<b>12</b>	<b>4</b>	<b>1</b>	

Source: GAO analysis of ORNL, LANL, and DOE data.

# Appendix IV: 2007 Member State Contributions to the Technical Cooperation Fund

In U.S. dollars

Member state	TCF target share	Amount paid to TCF	Percentage of target share paid <sup>a</sup>
Holy See	\$800	\$2,632	329%
Iceland	26,400	34,256	130
Canada	2,171,200	2,389,558	110
Lithuania	18,400	19,500	106
Belgium	824,800	860,215	104
United Republic of Tanzania	4,800	5,000	104
Syrian Arab Republic	29,600	30,000	101
Egypt	92,800	92,800	100
Liechtenstein	4,000	4,000	100
Australia	1,228,800	1,228,800	100
Albania	4,000	4,000	100
Austria	663,200	663,200	100
Bangladesh	8,000	8,000	100
China	1,584,800	1,584,800	100
Cuba	32,800	32,800	100
Cyprus	30,400	30,400	100
Czech Republic	140,800	140,800	100
Denmark	554,400	554,400	100
Finland	411,200	411,200	100
France	4,653,600	4,653,600	100
Hungary	96,800	96,800	100
India	324,800	324,800	100
Japan	15,024,800	15,024,800	100
Jordan	8,800	8,800	100
Malaysia	156,800	156,800	100
Netherlands	1,304,000	1,304,000	100
Norway	524,000	524,000	100
Pakistan	42,400	42,400	100
Poland	356,000	356,000	100
Romania	46,400	46,400	100
Slovakia	39,200	39,200	100
Slovenia	63,200	63,200	100
South Africa	225,600	225,600	100
Sweden	770,400	770,400	100

**Appendix IV: 2007 Member State  
Contributions to the Technical Cooperation  
Fund**

<b>Member state</b>	<b>TCF target share</b>	<b>Amount paid to TCF</b>	<b>Percentage of target share paid<sup>a</sup></b>
Switzerland	924,000	923,975	100
Thailand	160,800	160,800	100
Tunisia	24,800	24,800	100
United Kingdom	4,728,800	4,728,800	100
Vietnam	16,000	16,000	100
Zimbabwe	5,600	5,600	100
Sri Lanka	12,800	12,800	100
Republic of Korea	1,386,400	1,386,400	100
Turkey	287,200	287,200	100
Ireland	270,400	270,400	100
Spain	1,944,800	1,944,800	100
Bulgaria	12,800	12,800	100
Afghanistan	1,600	1,600	100
Armenia	1,600	1,600	100
Belarus	13,600	13,600	100
Cameroon	6,400	6,400	100
Croatia	28,800	28,800	100
Ecuador	14,400	14,400	100
Estonia	9,600	9,600	100
Ethiopia	3,200	3,200	100
Germany	6,684,800	6,684,800	100
Greece	408,800	408,800	100
Haiti	2,400	2,400	100
Italy	3,770,400	3,770,400	100
Kazakhstan	19,200	19,200	100
Kenya	7,200	7,200	100
Kuwait	124,800	124,800	100
Luxembourg	59,200	59,200	100
Mauritius	8,800	8,800	100
Mongolia	800	800	100
Nicaragua	800	800	100
Niger	800	800	100
Singapore	299,200	299,200	100
Uganda	4,800	4,800	100
Ukraine	30,400	30,400	100
United Arab Emirates	181,600	181,600	100

**Appendix IV: 2007 Member State  
Contributions to the Technical Cooperation  
Fund**

<b>Member state</b>	<b>TCF target share</b>	<b>Amount paid to TCF</b>	<b>Percentage of target share paid<sup>a</sup></b>
Yemen	4,800	4,800	100
Zambia	1,600	1,600	100
Latvia	11,200	11,200	100
Malta	10,400	10,400	100
Republic of Moldova	800	800	100
Angola	800	800	100
Burkina Faso	1,600	1,600	100
Tajikistan	800	800	100
Botswana	9,600	9,600	100
Kyrgyzstan	800	800	100
Serbia	14,400	14,400	100
Belize	800	800	100
United States of America	20,000,000	19,775,000	99
Algeria	58,400	58,000	99
Namibia	4,800	4,650	97
Russian Federation	848,800	821,231	97
Burma (Myanmar)	8,000	7,714	96
Indonesia	109,600	104,458	95
Venezuela	132,000	118,800	90
Colombia	119,200	105,856	89
Chile	172,000	140,000	81
Portugal	362,400	289,662	80
Mexico	1,453,600	1,109,294	76
Israel	360,000	140,000	39
Brazil	1,175,200	450,000	38
Argentina	737,600	113,084	15
Philippines	73,600	5,000	7
Morocco	36,000	0	0
Nigeria	32,000	0	0
Paraguay	9,600	0	0
Sudan	6,400	0	0
Uruguay	36,800	0	0
Islamic Republic of Iran	120,800	0	0
Bolivia	7,200	0	0
Bosnia and Herzegovina	2,400	0	0
Costa Rica	23,200	0	0

**Appendix IV: 2007 Member State  
Contributions to the Technical Cooperation  
Fund**

<b>Member state</b>	<b>TCF target share</b>	<b>Amount paid to TCF</b>	<b>Percentage of target share paid<sup>a</sup></b>
Côte d'Ivoire	8,000	0	0
Democratic Republic of Congo	2,400	0	0
Dominican Republic	27,200	0	0
El Salvador	16,800	0	0
Gabon	7,200	0	0
Georgia	2,400	0	0
Ghana	3,200	0	0
Guatemala	23,200	0	0
Iraq	12,000	0	0
Jamaica	6,400	0	0
Lebanon	18,400	0	0
Liberia	800	0	0
Libyan Arab Jamahiriya	101,600	0	0
Madagascar	2,400	0	0
Mali	1,600	0	0
Marshall Islands	800	0	0
Monaco	2,400	0	0
New Zealand	170,400	0	0
Panama	14,400	0	0
Peru	71,200	0	0
Qatar	49,600	0	0
Saudi Arabia	550,400	0	0
Senegal	4,000	0	0
Sierra Leone	800	0	0
The Former Yugoslav Republic of Macedonia	4,800	0	0
Uzbekistan	10,400	0	0
Benin	1,600	0	0
Central African Republic	800	0	0
Azerbaijan	4,000	0	0
Eritrea	800	0	0
Honduras	4,000	0	0
Seychelles	1,600	0	0
Islamic Republic of Mauritania	800	0	0
Chad	800	0	0
Montenegro	800	0	0
Malawi	800	0	0

**Appendix IV: 2007 Member State  
Contributions to the Technical Cooperation  
Fund**

<b>Member state</b>	<b>TCF target share</b>	<b>Amount paid to TCF</b>	<b>Percentage of target share paid<sup>a</sup></b>
Mozambique	800	0	0
Palau	800	0	0
<b>Total</b>	<b>\$80,003,200</b>	<b>\$76,491,085</b>	<b>96%</b>

Source: GAO analysis of IAEA data.

<sup>a</sup>IAEA defines the percentage of target share paid as the “rate of attainment,” a percentage arrived at by taking the total voluntary contributions paid to the TCF by member states for a particular year and dividing them by the TCF target for the same year.

# Appendix V: 2007 Technical Cooperation Disbursements, by Agency Program

In U.S. dollars

Program	Disbursement amount	Percentage of total TC disbursements
Nuclear power	\$3,346,800	3.6%
Nuclear fuel cycle and materials technologies	319, 200	0.34
Capacity building and nuclear knowledge maintenance for sustainable energy development	2,273,900	2.4
Nuclear science	7,611,300	8.2
Food and agriculture	11,911,500	12.8
Human health	26,410,000	28.3
Water resources	3,718,300	4.0
Assessment and management of marine and terrestrial environments	3,310,900	3.5
Radioisotope production and radiation technology	6,991,000	7.5
Safety of nuclear installations	5,601,200	6.0
Radiation and transport safety	6,830,100	7.3
Management of radioactive waste	7,177,000	7.7
Nuclear security	1,982,100	2.1
Safeguards	55,100	0.06
Public information and communication	2,400	0.003
Management of technical cooperation for development	4,291,300	4.6
Executive management, policy-making and coordination	405,500	0.43
Emergency preparedness	1,079,000	1.2
<b>Total</b>	<b>\$93,316,600</b>	<b>100.0%</b>

Source: GAO analysis of IAEA data.

Note: Percentages might not add to 100 due to rounding.



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# Appendix VI: Comments from the Department of State

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United States Department of State

*Assistant Secretary and Chief Financial Officer*

Washington, D.C. 20520

FEB 17 2009

Ms. Jacquelyn Williams-Bridgers  
Managing Director  
International Affairs and Trade  
Government Accountability Office  
441 G Street, N.W.  
Washington, D.C. 20548-0001

Dear Ms. Williams-Bridgers:

We appreciate the opportunity to review your draft report, "NUCLEAR NONPROLIFERATION: Strengthened Oversight Needed to Address Proliferation and Management Challenges in IAEA's Technical Cooperation Program," GAO Job Code 360915.

The enclosed Department of State comments are provided for incorporation with this letter as an appendix to the final report.

If you have any questions concerning this response, please contact Stephen Adams, Physical Scientist, Bureau of International Security and Nonproliferation at (202) 647-3302.

Sincerely,

James L. Millette

cc: GAO – Glen Levis  
ISN – Eliot Kang (Acting)  
State/OIG – Mark Duda

**DEPARTMENT OF STATE COMMENTS ON GAO DRAFT REPORT**

**NUCLEAR NONPROLIFERATION: Strengthened Oversight Needed to  
Address Proliferation and Management Challenges in  
IAEA's Technical Cooperation Program**  
(GAO-09-275, GAO Code 360915)

Thank you for the opportunity to respond to the GAO draft report "*Nuclear Nonproliferation: Strengthened Oversight Needed to Address Proliferation and Management Challenges in IAEA's Technical Cooperation Program.*"

**Recommendation #1**

**Establish a formal mechanism to facilitate greater and more timely information sharing on TC project proposals between IAEA and the United States and other countries—including detailed information on the TC proposals themselves as well as the results of IAEA's internal proliferation reviews of the proposals—so that proliferation and other concerns can be identified and addressed early in the project development cycle.**

We appreciate the GAO's recommendation to establish a formal mechanism to facilitate greater and more timely information sharing on TC project proposals. We would welcome receiving detailed information on IAEA TC proposals and its internal proliferation reviews. The information sharing envisioned in this recommendation would occur without the recipient State's express approval. Such information, however, is viewed by the IAEA and the recipient state to be confidential. Any proposal to change this situation would need to be approved by the IAEA Board of Governors. We believe the political realities of the Board of Governors make it unlikely that such a proposal for formal information-sharing would be adopted at this time. The recommendation would be viewed as inconsistent with the IAEA Statute by many Member States (and the IAEA Secretariat) and an unreasonable "micromanagement" of the IAEA's professional staff. A more achievable goal could be to work to ensure that the IAEA publishes its complete listing of projects earlier than has been the norm, e.g., two months prior to the meeting of the Technical Assistance and Cooperation Committee meeting, instead of the customary two weeks.

**Recommendation #2**

**Promote a regular and systematic process for obtaining, retaining, and updating information on prior TC project fellows to better track where and how the knowledge and expertise they have obtained is being applied.**

We endorse the recommendation to promote a regular and systematic process for obtaining, retaining, and updating information on prior TC project fellows to better track where and how the knowledge and expertise they have obtained is being applied. We believe that, if the IAEA were to implement this recommendation fully, it would help highlight the value of IAEA Technical Cooperation and Assistance projects in individual member states, as well as provide a resource for future projects, and contribute to the improvement of the efficiency and effectiveness of the program. TC has also been working on implementing an In-Touch Platform -- a system to establish, maintain and intensify contacts between the IAEA and potential, current and former stakeholders in the TC program which include experts and trainees. The capability of this system could potentially be expanded to obtain, retain, and update information on prior TC project fellows. However, on average, there are over 1,500 TC fellows and over 2,000 training course participants each year. Tracking such a large number of individuals regularly will require additional IAEA personnel and fiscal resources.

**Recommendation #3**

**Strengthen the TC program's mechanisms for collecting member states' contributions to the TCF to include withholding from non-paying states a percentage of TC assistance equivalent to the percentage of their target rate that they fail to contribute the TCF.**

The Department of State believes that this recommendation is intended to ensure that the recipient state is a true partner in the project and will help that state work toward sustainability. TC has already applied since 1995 the Due Account Mechanism. GOV/INF/2008/6 has shown the effectiveness of this mechanism. The rate of attainment has increased from 81.2% in 2001 to 95.7% in 2007. Some member states, however, that have not paid their contributions were the least developing countries (LDC) and we are concerned that withholding assistance to LDCs could negatively impact these countries. The Board will have to weigh carefully the questions relating to whether additional options such as this proposed recommendation can be applied efficiently and cost-effectively since the current mechanism is considered to function reasonably well.

**Recommendation #4**

**Establish criteria for determining when member states, especially those defined as high-income countries, no longer need technical cooperation assistance in particular fields and when such states could be graduated from further TC support altogether.**

This recommendation, which would benefit LDCs, was also made by the Senior Advisory Group on Technical Assistance and Cooperation (SAGTAC) at its meeting in November 1997. Specifically, SAGTAC recommended that higher income recipient Member States that reached a certain per capita GNP threshold should "graduate" and no longer be eligible for Technical Co-operation Fund (TCF) financed activities. At that time, one Member State representative on SAGTAC contended that it was premature to consider "graduation" solely on the basis of per capita GDP. Since all IAEA Member States, even those in the developed world, may receive IAEA assistance under the Statute, this recommendation would have to be implemented on a voluntary basis.

**Recommendation #5**

**Seek to implement new results-based performance metrics for the TC program that establish specific national, regional, and interregional social and economic needs and measure the collective impact of TC projects in meeting those objectives.**

At U.S. encouragement, TC has made significant progress over the last several years in implementing performance matrixes when planning, monitoring and evaluating projects. TC used the Programme Cycle Management Framework (PCMF) for the first time in 2006 to finalize the 2007-2008 TC Program. The PCMF is an interactive on-line system for planning and managing national and regional TC projects, which facilitates real-time collaboration between all relevant parts of the Secretariat and the stakeholders in Member States. This has enabled the development of better screened, higher quality projects. As a web-based platform, the PCMF has made the planning process more participatory and more transparent. This system incorporates the results-based management approach/project framework matrix. The GAO recommendation could be considered as an additional, next step in this system.

**Recommendation #6**

**Focus the TC program on a more limited number of high priority technical areas**

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**to maximize the impact of program resources.**

The Department of State agrees with this recommendation, which appears to be consistent with “the bigger and fewer projects approach” to TC. In this vein, the Department of State recommends that the TC Strategy (2002 Review) should be revisited in accordance with the *Report of the Commission of Eminent Persons on the Future of the Agency*.

**Recommendation #7**

**Encourage the TC program to reach out to private sector entities as part of its new partner and donor development strategy.**

The Department of State agrees with this recommendation. The TC program has already engaged with private sectors (non-traditional partners) in recent years as part of its strategic partnerships and the IAEA’s effort to look at its future requirements in the *Report of the Commission of Eminent Persons on the Future of the Agency*.

**Recommendation #8**

**Request member states to assess in their TC project proposals the prospects for commercialization of and private sector investment in the results of the projects. Such steps could include requiring information in the proposals on potential business plans, marketing strategies, and strategies for attracting commercial partners once IAEA support has concluded.**

The Department of State believes this is a good recommendation, but it could be difficult to include business plans and marketing strategies given the relatively small size of the average TC project, i.e., \$150K for 2009-2011. We suggest that this proposal be pursued at the program area level.

**Recommendation #9**

**That the Secretary of State enhance record keeping and formally document management actions regarding the discussion, action, and disposition of TC project proposals that DOE and the national laboratories identify as having potential proliferation concerns.**

The Department of State endorses this recommendation and can establish a process consistent with the availability of necessary personnel and funds.

**Recommendation #10**

**That the Secretary of State issue formal guidance with well-defined criteria—such as countries designated by State as sponsors of terrorism or gross human rights violators—that State should use as basis for approving or rejecting TC fellowship requests for nuclear studies in the United States. This guidance could include, among other things, a list of specific countries from which State would not approve TC fellows which could be updated and revised annually, or as other circumstances warrant.**

The Department of State supports this recommendation. Guidance can be formalized which determines how decisions are made with respect to TC fellowship requests for nuclear studies in the United States from countries not party to the NPT, from countries that are on the list as state sponsors of terrorism, and from countries that are deemed gross human rights violators.

**GAO Recommendation to Congress**

In addition to its recommendations that State explore undertaking a number of actions, including encouraging greater IAEA information sharing on TC projects, GAO is “considering asking Congress to consider requiring State to withhold a proportionate share of its contributions to the TCF for TC program assistance provided to U.S.-designated state sponsors of terrorism.” The Department of State **strongly opposes** such a proposed recommendation to Congress for a number of reasons. First, this proposed recommendation is counterproductive to the GAO’s own recommendation that states pay their full contribution to the TCF. The United States needs to set an example by paying its contribution in full and on time. Without this leverage, the U.S. will undermine its ability to persuade states with fewer financial resources to pay their share of the TCF. As GAO noted in the report, states failed to contribute about \$3.5M of their share for the TCF during 2007. If the United States had been required to withhold a proportionate share of its contribution for TC programs for state sponsors of terrorism during 2007, this would have increased the delinquency amount by approximately 40 percent. Moreover, the GAO report found, *inter alia*, that the IAEA Technical Cooperation Fund is fungible; therefore, this proposed recommendation would not necessarily stop IAEA TC projects in the targeted countries but instead diminish overall TCF funding. By targeting the entire TCF, the U.S. will anger states in the developing world. The proposed recommendation would be, thus, difficult to explain as being targeted solely at state sponsors of

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terrorism, and not at the TCF itself. Finally, Congress has specifically exempted the IAEA contribution from this type of proportionate withholding, which is applied to other contributions for international organizations, which we believe reflects a Congressional recognition of the importance of the IAEA program. We note that none of the IAEA TC projects benefiting state sponsors of terrorism to date have been shown to have contributed to a WMD program. Indeed, a large percentage of TC programs are for projects related to human health and other purposes related to development. While we recognize we should not wait for the system to “fail,” we believe that there are adequate safeguards within the Secretariat. Finally, if the United States were required to implement the GAO’s proposed recommendation, we believe it would have a significant and demonstrable negative impact in the ability of the United States to achieve its critical objectives with regard to the investigation of nuclear noncompliance cases such as Iran and Syria and improvements that we seek to make to the IAEA’s safeguards and nuclear security systems.

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# Appendix VII: GAO Contact and Staff Acknowledgments

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## GAO Contact

Gene Aloise, (202) 512-3841 or [aloisee@gao.gov](mailto:aloisee@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Glen Levis (Assistant Director), Eugene Gray, Simon Hirschfeld, and William Hoehn made key contributions to this report. Other technical assistance was provided by Jeffrey Phillips, Carol Herrnsstadt Shulman, Jay Smale, and Jeanette Soares.



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