

THE CONVENTION ON NUCLEAR SAFETY

HEARING

BEFORE THE

COMMITTEE ON FOREIGN RELATIONS UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

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THE CONVENTION ON NUCLEAR SAFETY

WEDNESDAY, MARCH 17, 1999

U.S. SENATE,
COMMITTEE ON FOREIGN RELATIONS,
Washington, DC.

The committee met, pursuant to notice, at 2:32 p.m. in room SD-419, Dirksen Senate Office Building, Hon. Paul Coverdell presiding.

Present: Senator Coverdell.

Senator COVERDELL. On behalf of Senator Helms, Chairman of the Senate Foreign Relations Committee, I on his behalf call this meeting to order on the question of the Convention on Nuclear Safety. I will be strictly as a facilitator on his behalf today, administrator, facilitator.

Each witness will be given 5 minutes for their testimony. The hearing record will be open for 5 business days for statements and questions by members. If you would indicate you are inserting material—I will be inserting statements for Senator Helms and Senator Biden in the record.

[The statements referred to are in the appendix on page 15.]

Senator COVERDELL. Let us see. The first—we have two panels and the first presenter will be Mr. Robert Einhorn, Deputy Assistant Secretary of State for Nonproliferation Affairs.

I will be inserting my own opening statement into the record formally, and I turn that over to you, Alex. And we will proceed with you, Mr. Einhorn. Thank you.

[The prepared statement of Senator Coverdell follows:]

PREPARED STATEMENT OF SENATOR PAUL COVERDELL

I am pleased to convene this hearing today on the issue of nuclear safety standards and, specifically, the Convention on Nuclear Safety. Let me say from the outset that I believe that this Convention stands a chance of making a modest contribution to the improvement of international nuclear safety. This Convention seeks to achieve and maintain a high level of safety for countries around the world that operate civil nuclear power reactors. It also provides the United States with a mechanism to encourage countries with civilian nuclear programs that do not meet Western safety standards to improve the safety at their installations. I think we all agree on the importance of ensuring that the use of nuclear energy is safe and well regulated. The Convention on Nuclear Safety is a step towards this goal, and I therefore am willing to support its ratification.

I believe that the U.S. secures several key objectives in the Convention. First, the treaty is limited to land-based civilian nuclear power plants designed for commercial electricity generation and does not include other nuclear facilities such as nuclear power reactors with military applications. Second, the convention articulates core principles for nuclear safety, rather than a detailed itemization of standards or rules. Third, the Convention does not establish a new international bureaucracy but rather relies on each ratifying country to prepare a report of its nuclear power pro-

gram. While this might have weaknesses of its own, I think it is preferable to the creation of another international bureaucracy.

However, there are some shortcomings in the Convention that we need to be candid about and that I hope some of our witnesses will touch on today. For example, the method to ensure and to review compliance with the treaty has not, to my knowledge, been finalized. As it is written, the Convention does not impose sanctions for noncompliance but seeks to encourage compliance through peer pressure. Each ratifying country will prepare a self-assessment report of its nuclear power program, which will be looked at by a "review group" of other member countries at periodic meetings. The potential problem with this approach is that the U.S. may not be in the "review groups" of countries who receive U.S. nuclear safety assistance. We need to make sure that the U.S. is present in all review meetings where a country receiving U.S. nuclear assistance is being reviewed.

There are other potential weakness that I will not go into great detail on today. But I would mention that it is my understanding that the costs to implement the treaty have not been fully determined. And, also, that the number of organizations dealing with nuclear safety issues continues to increase rapidly, often at the expense of the U.S. nuclear industry. I think we need to take measures to eliminate redundant or duplicative U.S. nuclear safety activities.

Despite these weaknesses, I believe that the Convention is a positive step toward the strengthening of nuclear safety standards around the world. I look forward to working with all of you in the coming years to move ahead with the implementation of this treaty.

Before our distinguished panelists begin, I would like to introduce the witnesses today and thank you for your participation. The witness on the first panel is Robert Einhorn, Deputy Assistant Secretary of State for Nonproliferation Affairs. Thank you for appearing before the committee today and we look forward to hearing the administration's views on this treaty. On the second panel, we will hear from Marvin Fertel, Senior Vice President for Nuclear Infrastructure, Support and International Programs from the Nuclear Energy Institute, and Gary Jones, Assistant Director for Energy, Science, and Resource Issues from the General Accounting Office. I know that our own domestic nuclear power industries set the lead for developing and maintaining nuclear standards around the world, so I especially look forward to hearing from you. Thank you all for your participation.

STATEMENT OF ROBERT J. EINHORN, DEPUTY ASSISTANT SECRETARY OF STATE FOR NONPROLIFERATION AFFAIRS, DEPARTMENT OF STATE

Mr. EINHORN. Thank you, Mr. Chairman. I am pleased to be here today to discuss with you our views on the Convention on Nuclear Safety and to ask that you take urgent action on the administration's request for advice and consent.

I have provided a longer written statement to the committee and I request that you include it in the record.

Senator COVERDELL. It will be inserted into the record.

Mr. EINHORN. Thank you very much.

The United States played a central role in drafting and negotiating the Nuclear Safety Convention. It was open for signature in September 1994 and entered into force in October 1996. The 49 contracting parties include all states with significant nuclear programs except the United States and India.

The convention can make an important contribution to raising levels of nuclear safety worldwide. It is the first international instrument to establish legal obligations on the safety of nuclear power plants. It codifies principles judged vital by technical experts to improve nuclear power safety worldwide. It reflects a long-standing U.S. interest in promoting an effective nuclear safety culture worldwide.

The convention covers land-based civilian nuclear power plants. Such facilities pose the most significant safety risks due to the

magnitude of their inventory of radioactive material, the complexity of their technology, known deficiencies in certain older reactor designs, and weak regulatory regimes and nuclear safety cultures in certain countries.

A key focus of the convention is on the requirement for all states parties to establish a strong and effective nuclear regulatory body with adequate authority, competence, and financial resources to perform effective and independent oversight. The convention also addresses safety at the facility level, with specific provisions for siting, design, construction, and operation of nuclear power plants. The United States fully meets all provisions of the convention.

I also want to emphasize what the convention does not do. It does not create a new multilateral regulatory body or another international organization or bureaucracy. Nor does the convention impose detailed prescriptive standards or rules.

Instead, the convention advances fundamental principles and obligates each party to implement those principles consistent with the requirements of differing reactor technologies, differing legal systems, and other national factors.

The convention will provide an important tool that regulators and operators can use to argue for the national resources they need to meet their safety obligations. The information provided by the national reports can also help nuclear safety assistance donors, such as the United States, to target their assistance more effectively.

On the key issue of financing convention activities, the modest secretariat functions for meetings of the parties will come from the IAEA—that is the International Atomic Energy Agency's—regular budget. The United States will also expend limited resources to prepare and review national reports and to attend meetings.

Senate advice and consent is needed next week to enable the United States to participate in the first review meeting of the parties, which begins April 12. Unless we ratify before that meeting, we will not be able to participate in the formal review of the national reports of other parties, including Russia and other recipients of U.S. nuclear safety assistance.

If we are to be able to ratify—if we are able to ratify the convention quickly, we can seek agreement from the states parties to waive the requirement that parties ratify 90 days in advance of a review meeting in order to participate in that meeting.

In conclusion, the administration believes that the convention can make a significant positive contribution toward raising levels of nuclear safety worldwide, particularly in the New Independent States, in Central Europe, in Eastern Europe, and in the developing world.

The U.S. nuclear industry has been kept informed of developments on the convention through periodic briefings. The industry supports the Nuclear Safety Convention as a means of enhancing the global safety culture, which can improve public acceptance of nuclear power and improve business opportunities.

We urge your favorable action. Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Einhorn is in the appendix on page 16.]

Senator COVERDELL. Mr. Einhorn, as I said a moment ago, the chairman has several questions that he would pose. If you will forgive me for reading those, but these are—I am facilitating this, as I said, for the chairman.

Question No. 1: Mr. Einhorn, one benefit of the Nuclear Safety Convention to the American taxpayer is that once it is ratified the administration will be able to scale back participation in other redundant areas. We are a member by last count of at least eight defense nuclear safety clubs and groups, most of which duplicate activities to be performed under the convention.

Do you agree that we should focus our efforts and our limited resources on performing nuclear safety activities under the auspices of the treaty rather than through a variety of nonbinding international clubs?

Mr. EINHORN. Thank you, Mr. Chairman. Indeed, we agree that our participation in the safety convention will be a critical focus of our international effort on safety. But there are a number of other efforts that are complementary and not in any way duplicative.

We support the committee's resolution of ratification, which addresses this point. There is a provision in section 2 of the resolution of ratification which requires the President to make a certification, and he is asked to certify to the appropriate committees that the U.S. Government will not engage in any multilateral activity in the field of international nuclear regulation or nuclear safety that unnecessarily duplicates a multilateral activity undertaken pursuant to the convention.

We will be pleased to recommend that the President provide that certification, because we do not believe there is duplication here. Other international efforts we are engaged in we believe are complementary.

Senator COVERDELL. I thank you.

Mr. Einhorn, the chairman wanted to ask you about one of these international clubs in particular, the International Nuclear Regulators Association, INRA. In a February 21, 1997, letter, the chairman of the NRC mentions that she sent to you an INRA terms of reference for your review. So I assume you are familiar with them.

Mr. Einhorn, in your mind is there a difference between INRA's purpose and that of the Nuclear Safety Convention?

Mr. EINHORN. Yes, Mr. Chairman, I believe there are very important differences between these two, these two groups. The Nuclear Safety Convention, of course, is a formal, legally binding international agreement. There are 49 contracting parties today. We hope the United States will be the fiftieth contracting party.

The INRA, the International Nuclear Regulators Association, is an unofficial group, an informal group, a very small one. It consists of the senior official involved in nuclear programs in eight of the advanced industrialized countries, countries with advanced civil nuclear power programs. As I say, it is an informal group. They do not meet pursuant to a legal obligation.

They meet twice a year, whereas the Nuclear Safety Convention requires its parties to have review sessions once every 3 years.

The purposes are very different. The Nuclear Safety Convention sets up a system of national reporting and peer reviews that provide strong peer pressure to ensure that all the contracting parties

are meeting their obligations to meet international safety standards.

The INRA has a very different function. These are individuals who meet informally twice a year, and their purpose is to exchange views on emerging nuclear regulatory challenges. Each of them have certain responsibilities in their own government. They look at various trends they see in the regulatory world, and it is an informal exchange of views. It is helpful to each of them in performing their own national responsibilities, but they are not in that capacity speaking for the U.S. Government.

So we see these organizations as very different. These are apples and oranges.

Senator COVERDELL. Mr. Einhorn, the chairman of the NRC has argued that one principal difference between INRA and the convention is membership. Specifically, she has claimed that INRA is important because it only brings together like-minded western countries with advanced regulatory systems rather than the global community, as is the case under the convention.

When asked by committee staff, however, if she would assure the committee that membership in INRA would remain limited to like-minded countries, she refused. The chairman thinks he knows why. According to United States negotiating guidance at the time of INRA's creation, the delegation was instructed to ensure that INRA would discuss at the earliest possible opportunity steps to be taken to broaden the initial membership. "Further, the issue of extending membership to nations without nuclear programs should be discussed."

So it hardly seems like the administration intends to keep INRA just a group of like-minded western countries. Do you agree?

Mr. EINHORN. Mr. Chairman, frankly, I am not aware of any plans for expanding membership. But one of the reasons that the group now consists of like-minded countries or representatives of like-minded countries is that it provides a good forum to discuss issues of real sensitivity. Unlike the national reports that will be widely shared, these discussions will be rather private and they can touch on matters of real sensitivity, and it could enable these representatives to speak with great frankness.

Senator COVERDELL. Let me just read this U.S. Government position on INRA. It relates back to the question, and then I can look up and actually listen to your answer for a moment.

"The U.S. delegation should request INRA discuss at the earliest possible opportunity steps to be taken to broaden the initial membership, taking into consideration such criteria as geographical distribution, activity of programs, and inclusion of other national policy-setting regulators, example those with environmental or health responsibility.

"Further, the issue of extending membership to nations without nuclear programs should be discussed in light of the widespread use of nuclear energy and radioactive materials."

Mr. EINHORN. Because this record is important and we have to move quickly if we are to meet our deadline, rather than get back to you with an answer for the record, let me just consult my colleagues.

Senator COVERDELL. Please.

[Pause.]

Senator COVERDELL. Yes, sir.

Mr. EINHORN. Thank you, Mr. Chairman, for holding off for a moment.

What you read is a position of the Nuclear Regulatory Commission. The chairman of our NRC, of course, represents the NRC on this group. This is not a U.S. Government position that you were reading.

I understand from my colleagues that participants—

[Pause.]

Senator COVERDELL. Let me do this. It is the committee staff's view these are instructions issued to the chairman of the NRC. I have said the record will be open for 5 days. This is obviously a critical point to the chairman, so we will clarify the question. The source of this is redacted, so we will clarify where we feel—where this emanates from, and give you an opportunity then to respond formally following the meeting.

Mr. EINHORN. That is a very good idea. Thank you, Mr. Chairman.

[The following response was received subsequent to the hearing:]

The Committee's question concerns a preliminary draft of the instruction cable for the first meeting of the International Nuclear Regulators' Association (INRA). At the request of another NRC Commissioner, the cable instructed NRC Chairman Jackson to recommend, at the first meeting of the INRA, that future expansion of the group's membership be discussed at that meeting. She did raise this matter at the first INRA meeting, held in Paris May 29–30, 1997. The consensus reached was that the group would begin small, with only the eight original members (nuclear regulators from the U.S., U.K., Canada, Germany, France, Spain, Sweden, and Japan). Only after an initial two-year period of consolidation (which coincided with NRC Chairman Jackson's chairmanship of the group) might the question of membership be reconsidered.

Chairmanship of INRA has now passed to Mr. Laurence Williams, Director and Chief Inspector of the United Kingdom's Nuclear Installation Inspectorate. At this time the consensus of all INRA members, including the U.S. member, is that the membership should remain limited to the current eight heads of nuclear regulatory agencies, all from Western developed countries with substantial civil nuclear power sectors.

Senator COVERDELL. I am going to—please.

Mr. EINHORN. I was just going to say that the members of INRA now do have in mind that this group stay small so that it can operate with frankness on sensitive issues. Some of the members have an interest in some expansion, but we understand that they are not interested in making this a large and unwieldy body.

It is primarily because they themselves have neighbors or friends that, for a variety of reasons, they may wish to bring into the group or the club, as you mentioned. But it is not any intention of ours or of the Nuclear Regulatory Commission to expand this group. Its value is in its being compact and its ability to operate in an informal manner.

Senator COVERDELL. Well, both in the resolution you have and in the nature of the questions and the opportunity to respond, I think there is a clear sense where the chairman of the committee is moving, and the exchange might reinforce the view you just expressed.

Mr. EINHORN. Thank you, Mr. Chairman. That comes through very clearly, but I do not think there is a real difference between

us on this. We are not interested in promoting a large body that in any way rivals or duplicates the functions of the Nuclear Safety Convention.

Senator COVERDELL. I thank you, Mr. Einhorn. I have two more questions and then we will move to the next panel.

The chairman has a question about the negotiating position taken by the United States on INRA. The guidance states that the group will not create a super—supra-national organization nor engage in oversight of national programs or site visits. Yet, according to information provided the committee by an anonymous source within the administration, the chairman of the NRC uses her position at NRC to acquire access for the foreigners to facilities, such as Lawrence Livermore National Labs, the Plutonium Facility, and AVLIS, A-V-L-I-S.

I am reading from a memorandum on the letterhead, “United States Nuclear Regulatory Commission,” from Shirley Ann Jackson, dated February 11, 1998. The first paragraph says: “The International Nuclear Regulators Association, INRA, held its second meeting January 8th through 9th, 1998, at the NRSC Walnut Creek Field Office in California. The meeting was extended to include a facility visit to Lawrence Livermore National Laboratory in California and the Yucca Mountain site characterization project in Nevada.”

I will not proceed with this. I think you have the thrust of the question here.

Mr. EINHORN. Senator, these colleagues of the chairman’s were the kinds of officials in other regulatory agencies of other countries that would normally visit her and her colleagues in the NRC, that would visit various kinds of sites in the United States in their own national capacities. It is in my thinking not their participation in INRA that gives them any kind of a special access to these facilities. These are the very individuals who would normally be interacting with the NRC in this fashion.

Senator COVERDELL. If you will give me just a moment.

[Pause.]

Senator COVERDELL. I am going to read from the anonymous source two paragraphs. It alludes to: “The fifth document is a letter from the chairman of Taiwan’s Atomic Energy Council. Taiwan has wanted to join INRA from its inception, but was refused. Instead, at the last meeting the People’s Republic of China was asked to join. The potential for harm to the U.S. Government foreign policy from this move could have repercussions in the future.

“The seventh document shows that, notwithstanding Jackson’s claim that the INRA would take less than one FTE and no dollars from the NRC budget, she is hosting the INRA participants, has stationery and pamphlets specifically designed and printed for INRA, and, more importantly, Jackson uses her position at the NRC to acquire access for the foreigners to facilities such as Lawrence Livermore National Labs, the Plutonium Facility, and AVLIS”—which is a restatement of the question I just issued.

Would you have any additional comment?

Mr. EINHORN. Just to say, Mr. Chairman, that China was not asked to join INRA. It was asked at a certain point to make a presentation. It is not under consideration for membership in INRA.

On the question of access, again, INRA participation is not being used as a basis to invite colleagues to certain facilities in the United States. These colleagues would be invited to these kinds of facilities in performance of their normal national responsibilities in any event. It is not as if INRA gives them a special claim to access.

Senator COVERDELL. I thank you very much.

The final question, then. The chairman says he is puzzled by a January 23, 1998, letter on INRA stationery from the chairman of the United States NRC to the U.S. Secretary of Energy. At the outset Ms. Jackson states: "I am writing on behalf of the International Nuclear Regulators Association, INRA, concerning preparations for the energy ministerial scheduled for March 30th to the 31st in Moscow."

Mr. Einhorn, do you believe it is appropriate for a senior U.S. Government official to lobby another senior U.S. Government official regarding the United States' negotiating position at an upcoming summit on behalf of an international club of countries?

Mr. EINHORN. Mr. Chairman, it was not clear from the passage you read that this was an effort to lobby another member of the U.S. Government to take any kind of position. It was not clear at all what the request was of the Secretary of Energy.

Senator COVERDELL. Mr. Einhorn, what I am going to suggest we do here—I am seeing the letter for the first time. I do not know whether you have seen it or not. I think the chairman could rightfully draw, just from my quick perusal, rightfully draw the conclusion that is embraced in his question. So in the 5-day period for exchange, this is obviously a letter that you can see, and you might review the letter and then formally respond to the question that I just gave you.

Mr. EINHORN. Thank you. I would like the opportunity to do that. [The following response was received subsequent to the hearing:]

In the spring of 1996 the U.S. and other G-7 governments plus Russia held a special Summit meeting in Moscow to address issues of nuclear safety and security. Since that special Summit meeting these matters have been important elements of the agenda for each G-7/G-8 Summit. The January 1998 letter in question was written by U.S. NRC Chairman Jackson in her capacity as Chairman of the International Nuclear Regulators' Association (INRA) to inform Secretary of Energy Pena. It contained the views of INRA members on the importance of sustaining safety as the first priority in nuclear plant operations as competition and deregulation of the electricity industry grow. These views were particularly relevant to the G-7/8 process, since INRA's membership is comprised of the heads of nuclear regulatory agencies of the eight Western countries with the most advanced nuclear industries. Six of the eight INRA governments are also G-7 members. The INRA members also offered some thoughts on technical safety issues and their view that safety should remain on the Summit agenda. The INRA members proposed that energy ministers "reaffirm their commitment to safety as the fundamental requirement for a nuclear program" and "reaffirm the principles and elements recently codified in the Convention of [sic] Nuclear Safety." The heads of these nuclear regulatory authorities further state that "Parties to the Convention should actively participate in this peer review process in the most transparent, candid, serious, and technically competent manner." The views expressed in the letter are shared by the Administration. We hope the Committee and other Members in Congress are supportive as well.

Senator COVERDELL. All right. Mr. Einhorn, I appreciate very much your testimony and your responsiveness to the questions.

Mr. EINHORN. Thank you, Mr. Chairman.

Senator COVERDELL. Thank you.

The second panel will consist of Mr. Marvin Fertel, senior vice president, Nuclear Infrastructure, Support, and International Programs, Nuclear Energy Institute, and Ms. Gary Jones, Associate Director for Energy, Resources and Science Issues, Resources, Community, and Economic Development Division, General Accounting Office.

We will begin with you, Mr. Fertel. Thank you for coming.

**STATEMENT OF MARVIN S. FERTEL, SENIOR VICE PRESIDENT,
NUCLEAR INFRASTRUCTURE, SUPPORT, AND INTER-
NATIONAL PROGRAMS, NUCLEAR ENERGY INSTITUTE**

Mr. FERTEL. Thank you, Mr. Chairman, and may I request that my full statement be included in the record.

Senator COVERDELL. It will be included in the record.

Mr. FERTEL. Let me first express our gratitude to you, Senator Coverdell, for taking the initiative to facilitate, in your terms, this hearing today and for really providing an opportunity for getting the convention ratified in time for the first review meeting coming up in April.

The Nuclear Energy Institute sets policy and positions on various issues affecting our industry. NEI represents over 275 companies, including every U.S. utility that operates a commercial nuclear plant in this country. We also have all of the vendors, fuel suppliers, and engineering firms that support those people.

Mr. Chairman, the nuclear energy industry supports ratification by the U.S. Senate of the Convention on Nuclear Safety. The Nuclear Energy Institute's executive committee in 1997 passed a resolution encouraging Senate ratification of the convention and that resolution is included with my prepared remarks.

Before I discuss the importance of ratification of the convention, I would like to briefly provide the committee with a sense of the benefits provided by nuclear energy in the United States and the world. Today nuclear power plants produce about 20 percent of America's electricity. It is our second largest source of electricity. Nuclear power plants are also our largest source of emission-free electricity, an important consideration as Congress and other policymakers recognize the growing nexus of energy and environmental policy. Globally, 441 nuclear plants in 33 nations generate 17 percent of the world's electricity.

Within this broad context, ratification of the convention—

Senator COVERDELL. Excuse me for interrupting. Would you repeat that number again?

Mr. FERTEL. Yes; 441 nuclear plants in 33 countries generate 17 percent of the world's electricity.

Senator COVERDELL. Thank you.

Mr. FERTEL. I caught a sore throat from my wife over the weekend.

Senator COVERDELL. I have been dealing with the same subject here for a while.

Mr. FERTEL. I apologize.

Within this broad context, ratification of the convention by the United States is important for the following reasons. First, the U.S. Government and the nuclear energy industry have provided leadership in shaping the convention and it reflects the safety practices,

programs, and culture inherent in the U.S. program. The industry believes these programs are necessary for the safety and reliability of nuclear programs worldwide.

Second, as Mr. Einhorn said, all other countries that have significant nuclear energy programs except the United States and India have already ratified the convention. We believe that U.S. participation and particularly leadership is necessary.

Third, the convention provides a forum for the United States to systematically review the nuclear programs for countries such as Russia and the Ukraine, to which the United States provides nuclear safety program assistance.

Finally, the convention also provides an excellent framework and process to support the development of new safe nuclear power programs in countries that may be looking to establish such programs.

In implementing the convention, the industry encourages the administration to ensure that the Government gets appropriate input and involvement of the U.S. industry prior to and possibly at review meetings. Also, U.S. ratification of the convention should not impose any new regulatory requirements on the U.S. industry beyond those already required to meet Nuclear Regulatory Commission regulations.

Moreover, the administration should not fund activities associated with implementing the convention from user fees collected from NRC licensees for the agency's regulatory activities. Rather, we believe, given the benefits to the Nation, funds should be appropriated from other sources.

The administration should also—and it sounds like the ratification resolution does this—look to eliminate existing governmental activities that are intended to achieve benefits that would be derived through the convention.

Given the scheduled April 12, 1999, review meeting, NEI urges the committee and the U.S. Senate to act promptly to ratify the convention so that the United States can attend this first review meeting. U.S. leadership and participation is essential for successful implementation of the convention and, given the importance of assuring safe operation of nuclear plants worldwide, it is clearly in the best interest of our Nation and the world at large.

The Convention on Nuclear Safety establishes a framework for improving nuclear safety among all countries that operate nuclear power plants and provides a basis for dialog with those countries planning to build and operate commercial nuclear facilities.

In conclusion, the U.S. industry encourages prompt Senate ratification of the Convention on Nuclear Safety and is committed to working with the U.S. Government on implementation of the convention.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Fertel is in the appendix on page 18.]

Senator COVERDELL. Thank you, Mr. Fertel.

Ms. Jones.

**STATEMENT OF GARY L. JONES, ASSOCIATE DIRECTOR FOR
ENERGY, RESOURCES AND SCIENCE ISSUES, RESOURCES,
COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION,
GENERAL ACCOUNTING OFFICE**

Ms. JONES. Thank you, Mr. Chairman.

I would also like to request that my full statement be included for the record.

Senator COVERDELL. It will be included in the record.

Ms. JONES. Thank you.

Let me briefly summarize our work on the Convention on Nuclear Safety. We have issued two reports since 1993 that have tracked the convention's development and implementation. My comments this afternoon will focus on its objectives and scope, the process for reviewing compliance, the dissemination of information related to convention proceedings, and implementation costs.

The need for a global focus on nuclear safety was underscored when radioactive materials from Chernobyl were carried beyond the national boundaries of the Soviet Union to East and West European countries. The Convention on Nuclear Safety is viewed as one of the chief policy instruments to promote a nuclear safety culture and encourage countries with Soviet-designed nuclear reactors to improve their safety.

The convention is not viewed as a solution or a quick fix, but as a positive step toward improving nuclear safety worldwide. It does not provide sanctions for noncompliance, nor will it require the closing of unsafe nuclear reactors. Rather, as Mr. Einhorn noted, it seeks to achieve its safety objectives through adherence to general safety principles, such as establishing an independent body to oversee safety, rather than by requiring compliance with binding technical standards.

The convention's peer review process is central to its success. Countries submit self-assessment reports detailing the measures they have taken to implement the convention. Groups of countries will then critically examine and comment on those reports to encourage countries to improve their nuclear safety programs.

However, the convention does not specify the form and content of the peer review process. Therefore it is unclear how the process will actually work and how peer pressure will accomplish change.

Another issue that will impact the success of the peer review process is the quality of the individual country self-assessment reports. Because of the differences among the countries and nuclear safety programs and available resources, NRC officials told us that they anticipated unevenness in the quality and detail of these reports, and that could affect the level of review and analysis.

The convention also allows for countries that are outside a particular country grouping to submit comments or questions as an observer. NRC believes that this will enable the concerns of the United States about any country's report to be heard. However, we will not really know how effectively this will work until after the first peer review meeting.

Public dissemination of information about the country's progress in meeting the terms of the convention can play a role in influencing compliance and will enhance the credibility of the process. However, it is uncertain how much information from the peer re-

view meeting will be available to the public. The countries can limit distribution of their reports. At least one report that has been prepared for the April 1999 peer review meeting has not been made public, but others are available to the public. Some can be accessed on the Internet.

The convention also provides for the public distribution of a report summarizing the issues discussed and the decisions reached during the peer review meeting. However, it appears that the report will be generic and will not identify countries by name. NRC officials told us that the convention did not specifically provide for the kind of openness that they would prefer, but they believe that over time more information would be made available.

Costs to the United States to prepare for and attend the first review meeting will be significantly less than the \$1.1 million we reported in 1997. Since the United States has not ratified the convention, U.S. officials have not participated in the full range of meetings and activities related to the convention.

Thank you, Mr. Chairman.

[The prepared statement, including attachments, of Ms. Jones, is in the appendix on page 22.]

Senator COVERDELL. Thank you both.

Mr. Fertel, you obviously followed the drift of the questions of the chairman and you alluded to some concerns as related to those questions in terms of overlapping and redundant responsibilities and costs and their effect on your members.

You might comment on it now, but, more importantly, measuring these questions, your institution may want to respond to those, use those questions as an opportunity to clarify more fully your concerns with regard to costs, treaty costs and other associated costs through these other organizations, clubs, whatever. You are welcome to comment if you would like.

Mr. FERTEL. I think sharing within the nuclear industry is part of the culture and has tremendous value. That is how we try and avoid safety problems, with openness and sharing. Just speaking from the industry side, having said that and we encourage it and we foster it as much as we can, we find in our own industry we have loads of special interest groups. We have not called them clubs, but we call them special interest groups, which often divert our resources from what they should be doing, with all the best intentions.

Generally what we find is that it is useful, but very duplicative of other things that are going on and generally not something that management when they look at wants to continue. I think that the statement in the resolution of ratification for the Government to take a hard look across the spectrum of activities probably has real value.

Senator COVERDELL. Has the General Accounting Office, citing that redundancy section of the resolution, had any reflections or thoughts with regard to redundant costs that are pointed to by the questions of the chairman and-or are noted in the section in the resolution?

Ms. JONES. Actually, Senator, the chairman of the committee has asked GAO to look at the duplication between INRA and other organizations that you have alluded to in the questions today. So we

have just started our work in that area, so we are not able to comment on that today. But we will when our work is completed.

Senator COVERDELL. Do you have any idea as to how long it will take for that work to be completed?

Ms. JONES. We are looking to get back to committee staff in a couple of months and let them know what our preliminary thoughts are on that issue.

Senator COVERDELL. With that, I am going to thank our panel for its presentations. As I said, we have included your full statements in the record. There are 5 days open for other committee members and-or others to insert questions in the record. We welcome you to elaborate to any greater extent that you would like in that open period.

With that, we will adjourn the meeting.

Ms. JONES. Thank you.

Mr. FERTEL. Thank you, Mr. Chairman.

Senator COVERDELL. Thank you.

[Whereupon, at 3:12 p.m., the committee was adjourned.]

APPENDIX

PREPARED STATEMENT OF SENATOR JESSE HELMS

I am pleased that the Committee will undertake consideration of a resolution of ratification for the Nuclear Safety Convention. This resolution enjoys the support of the Administration, Senator Biden, and myself.

The Convention, if used to its fullest potential, could serve as an important tool to encourage countries (most particularly, those possessing Soviet-era nuclear power plants) to improve their safety procedures. It will do so without harming the U.S. nuclear industry or imposing foreign pressure on the United States' domestic regulatory process.

I am pleased that the administration secured a number of critical U.S. objectives in the process of negotiating the Convention. Specifically, I note that the treaty is limited to land-based civilian nuclear power plants and does not cover nuclear power reactors with military applications.

Second, the Convention simply establishes a few fundamental principles for nuclear safety, rather than a detailed itemization of standards or rules. Detailed technical provisions would unnecessarily intrude on our sovereign authority to regulate the U.S. nuclear industry.

Third, the Convention does not establish any new international bureaucracy.

For these reasons, I support the treaty and urge adoption of the resolution.

PREPARED STATEMENT OF SENATOR JOSEPH R. BIDEN, JR.

I want to thank Chairman Helms for scheduling today's hearing and, especially, Senator Coverdell for chairing this hearing.

The Convention on Nuclear Safety is a modest step toward improving nuclear power safety around the world, especially among countries that lack the many years of experience that we have with these systems. The convention is sensible and low-cost, and the Senate should give its advice and consent to ratification before the Easter recess.

One concern has been the costs of implementing this convention. I am pleased that the Contracting Parties have decided to conduct nearly all of their work in English, to minimize translation costs. I also note that the United States has to pay its share of the costs whether we join the convention or not. That is because the convention is administered by the International Atomic Energy Authority, with the costs included in our regular IAEA contribution. In practice, the U.S. share of administrative costs for the convention is expected to be under \$100,000 per year.

This convention creates a process in which, once every three years, each Contracting Party submits a report on its nuclear power safety procedures. Then each of the other Contracting Parties may request further clarification or critique that report. This will give experienced countries like the United States a forum in which to critique the reports submitted by countries with less nuclear power experience.

The first reports have already been submitted, as this convention came into force many months ago. (It was signed in September 1994 and submitted to the Senate in May 1995.) The first Review Conference will take place next month, and it would make sense for the United States to become a Contracting Party before that conference, so that we could comment on those reports. Otherwise we will have to wait three years for that opportunity. So I urge quick action on a resolution of ratification.

PREPARED STATEMENT OF ROBERT J. EINHORN

Mr. Chairman, Members of the Committee: I am pleased to provide the Senate with our views on the Convention on Nuclear Safety. The Administration strongly supports United States adherence to the Convention and hopes the Senate can take prompt action to permit ratification.

BACKGROUND

The process of developing this Convention was formally launched by a resolution of the 1991 General Conference of the International Atomic Energy Agency (IAEA). The United States was a key supporter of that resolution and played a central role in drafting and negotiating the Convention. After three years of work by over 120 experts from 50 countries under IAEA auspices, the Convention was opened for signature in September 1994. There are currently 65 signatories, including the United States. Most countries with major nuclear power industries moved quickly to ratify the Convention, and it entered into force in October 1996. The 49 Contracting Parties include all states with significant nuclear power programs, except for the United States and India.¹

WHAT THE NUCLEAR SAFETY CONVENTION CAN DO

The Convention can make an important contribution to raising levels of nuclear safety worldwide. It is the first international instrument to establish legal obligations regarding the safety of nuclear power plants. It codifies a comprehensive range of principles judged vital by technical experts to improve nuclear power safety worldwide. The scope of the Convention is limited to land-based civilian nuclear power plants. Such facilities pose the most significant safety risks due to the magnitude of their inventory of radioactive material, the complexity of the technology, known deficiencies in foreign-designed reactors in some countries, and the fact that regulatory regimes and nuclear safety culture in some countries are weak.

A key focus of the Convention is on the requirement for all States Parties to establish a strong and effective nuclear regulatory authority. The Convention obligates States Parties to maintain a national regulatory body with adequate authority, competence, and financial and human resources to perform effective oversight. Regulatory responsibility must also be effectively separate from nuclear power promotion and utilization responsibilities. In this respect, among others, the Convention implements long-standing U.S. policy to support development of an effective nuclear safety culture worldwide for civilian nuclear power programs.

The Convention establishes key obligations for States Parties. Governments are committed to take appropriate steps to ensure that:

- Priority is given to safety;
- Licensed plant operators have the prime safety responsibility;
- Both the operator and the nuclear regulator have adequate financial and human resources to meet their safety obligations;
- Quality assurance programs are established and implemented;
- Comprehensive and systematic safety assessments are made throughout a reactor's life, and are verified;
- Radiation protection measures keep population exposure as low as reasonably achievable;
- Off-site and on-site emergency response plans are in place and tested routinely.

The Convention also addresses safety at the facility level, with specific provisions relating to siting; design and construction; and operation of nuclear power plants.

The United States fully meets all provisions of the Convention. However, this is not the case for all countries, and some States Parties will need to take further actions to comply with these obligations. Identifying and facilitating those further actions is a primary purpose of the Convention.

The Convention is implemented in part by a process of national reports subject to peer review. The States Parties convene a Review Meeting not less frequently than every three years. Before the meeting each State Party submits a national report addressing how it is meeting its responsibilities under the Convention. Each

¹To date the Contracting Parties are: Argentina, Armenia, Australia, Austria, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Croatia, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, the Republic of Korea, Latvia, Lebanon, Lithuania, Luxembourg, Mali, Mexico, Moldova, the Netherlands, Norway, Pakistan, Peru, Poland, Portugal, Romania, the Russian Federation, Singapore, the Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom.

national report is then subject to rigorous peer review by competent officials from the other States Parties at periodic meetings. The first Review Meeting will begin April 12, in less than four weeks. States that are now Parties submitted their national reports to the Convention's Secretariat at the International Atomic Energy Agency in October 1998. These reports were distributed to all States Parties for review and analysis before the first Review Meeting.

WHAT THE NUCLEAR SAFETY CONVENTION DOES NOT DO

It is important to note what the Convention does not do. First, it does not create a new multilateral regulatory body, or another international organization or bureaucracy. Nor does the Convention impose detailed prescriptive standards or rules. Instead, the Convention advances fundamental principles. Detailed technical provisions would intrude on the responsibility of national governments to regulate their nuclear industries consistent with the requirements of differing reactor technologies, legal systems, and other factors. Further, negotiating such technical provisions might have resulted in a Convention with lowest common denominator requirements.

We believe, from experience, that peer reviews are an effective mechanism for inducing change. The Nuclear Safety Convention is frequently referred to as an "incentive" convention. It is intended to help countries bring their nuclear safety systems up to an acceptable international level through a process that does not alienate those governments with weak safety systems, but rather gives them motivation to join and tools to evaluate and strengthen their programs. The Convention can also provide an important means for regulators and operators to argue for needed national resources to ensure they can meet their safety obligations. The information provided by the national reports can also help nuclear safety assistance donors, such as the United States, to target their assistance more effectively.

On the key issue of financing Convention activities, the modest secretariat functions for the meeting of the parties not less than every three years will come from the IAEA's regular budget. The U.S. will also expend modest resources to prepare and review national reports and to attend meetings of the parties.

WHY THE U.S. SHOULD RATIFY

At the April 1996 Moscow Nuclear Safety Summit, and at the Denver and Birmingham G-8 summits in 1997 and 1998, and the March 1998 Energy Ministerial in Moscow, the participants committed to ratifying the Convention as soon as possible as a keystone of their nuclear safety actions. Our G-7 partners and the Russian Federation have since become parties to the Convention and continue to urge all countries to become parties to it. Delay in U.S. ratification would give some the inaccurate impression that the U.S. is not as committed to the principles of nuclear safety agreed to at successive Summits. Delay would also make it harder for the U.S. to argue persuasively that others should raise their safety standards, and could encourage others not listen to us on safety issues. More immediately, however, Senate advice and consent next week is needed to enable the U.S. to participate in the first Review Meeting of the Parties, beginning April 12. Unless we ratify before that meeting, we will not be able to participate in the formal review of the national reports of other Parties, including Russia and other recipients of U.S. safety assistance.

The U.S. chaired three meetings of signatories (in March and November 1995; and June 1996) to develop options and alternatives for implementing the Convention. The U.S. has worked actively to protect U.S. interests, including undue intrusion on our own nuclear industry and domestic nuclear regulatory process. In January 1997, at the request of the Senate Foreign Relations Committee, the General Accounting Office (GAO) presented an update of its 1993 report on the Convention, focusing on (1) how the Convention will be enforced, and (2) what the expected costs to the U.S. will be in implementing the Convention.

At an April 1997 Preparatory Meeting the States Parties took decisions that respond directly to these concerns. At that meeting implementing procedures—guidelines regarding the review process, guidelines regarding national reports, and rules of procedure and financial rules—were reviewed and recommended for adoption. In addition, decisions were taken on languages to be used, with English designated as the single working language for most aspects of the review process; and on the conduct of country group discussions.

The issues which the GAO report highlights were also discussed at the April 1997 Preparatory Meeting. Despite having played a leading role in developing the Convention, as a non-party the United States could not participate in that meeting.

However, we were able to make U.S. views known informally through like-minded delegations, and as a result the decisions taken reflect our views.

The important Organizational Meeting was convened September 29–October 4, 1998. At that time national reports were submitted. The Contracting Parties were organized into country groups of 6–8 members, and group Rapporteurs were selected. Contracting Parties have had over four months to review all national reports and submit questions or requests for clarification to Rapporteurs. Outside of one's assigned country group, participation in group discussions will be permitted for those countries which submitted questions to the Rapporteur at least two months before the first Review Meeting, which begins April 12, not quite four weeks from today.

It is essential that the U.S. continue its strong influence on the development of these activities. Our inability to participate in the Organizational Meeting was unfortunate. However, if we are able to ratify the Convention before the end of March, we can seek agreement from the States Parties to waive the requirement that Parties ratify 90 days in advance of a review meeting in order to participate in that meeting. With Senate advice and consent next week; if the United States is able to complete and distribute our national report before the meeting; and if the other States Parties agree to waive the 90 day requirement, we will be able to participate in this very important first review of national reports. As you know, some of the governments submitting reports receive assistance from the United States to strengthen their nuclear reactor safety programs, and participating in this first Review Meeting would provide important insight into the degree to which that assistance is having effective results.

IN CONCLUSION

The Administration believes that the Convention can make a significant positive contribution towards raising levels of nuclear safety worldwide, particularly in the New Independent States, in Central and Eastern Europe, and in the developing world.

The U.S. nuclear industry has been kept informed of developments on the Convention through periodic briefings. The industry supports the Nuclear Safety Convention as an effective mechanism to improve the global nuclear safety culture, which can improve public acceptance of nuclear power and improve business opportunities.

We urge quick and positive Senate action on advice and consent to ratification. Your favorable action will permit us to seek agreement of the other States Parties to participate in this very important first meeting on the Convention. This will give us the opportunity to review national reports and use the information to better focus our assistance programs. In this way we can work more effectively to realize our objective of an effective global nuclear safety culture, one that establishes effective, independent nuclear safety regulatory authorities in all countries with nuclear power programs to enforce safety at the plants.

Thank you Mr. Chairman.

PREPARED STATEMENT OF MARVIN S. FERTEL

Mr. Chairman, Ranking Member Biden and distinguished members of the committee, my name is Marvin Fertel. I am the senior vice president for nuclear infrastructure support and international programs at the Nuclear Energy Institute, the Washington, D.C., policy organization for the nuclear industry. I am pleased to testify this morning in support of U.S. ratification of the Convention on Nuclear Safety.

The Nuclear Energy Institute sets industry policy positions on various issues affecting the industry, including federal regulations that help ensure the safety of 103 operating nuclear power plants in 31 states. NEI represents 275 companies, including every U.S. utility licensed to operate a commercial nuclear reactor, their suppliers, fuel fabrication facilities, architectural and engineering firms, labor unions and law firms, radiopharmaceutical companies, research laboratories, universities and international nuclear organizations.

SUMMARY OF KEY POINTS

The nuclear energy industry supports ratification by the U.S. Senate of the Convention on Nuclear Safety. Nuclear power plants produce nearly 20 percent of America's electricity—the second largest source of electricity. Nuclear power plants also are our largest source of emission-free electricity—an important consideration as Congress and other policymakers recognize the growing nexus of energy and envi-

ronmental policy. Among the Congress, and indeed across the United States, there is a growing awareness that this is a proven industry with more than 2,000 reactor years of operating experience and with a product that will become even more valuable as we meet the demands of the 21st century.

Globally, 441 nuclear power plants in 33 nations generate 17 percent of our electricity. These nuclear energy facilities are becoming more important as the clean air benefits of nuclear energy, energy security considerations and economic factors are prompting many countries to pursue the expansion of their existing nuclear power programs, or the development of new nuclear power programs.

Ratification of the Convention on Nuclear Safety by the United States is important for these reasons:

- The U.S. government and the U.S. nuclear energy industry have provided leadership in shaping the Convention and it reflects the safety practices, programs and culture inherent in our programs. The industry believes these programs are necessary to the safety and reliability of nuclear programs worldwide;
- All other countries that have significant nuclear energy programs, except the United States and India, have already ratified the Convention;
- The Convention provides a forum for the United States to systematically review the nuclear programs for countries, such as Russia and the Ukraine, to which the United States provides nuclear safety program assistance; and
- The Convention also provides an excellent framework and process to support the development of new, safe nuclear power programs in countries that may be looking to establish such programs for energy security and environmental reasons.

The Nuclear Energy Institute's Executive Committee, representing the leadership of the U.S. commercial nuclear industry, passed a resolution in 1997 encouraging prompt Senate ratification of the Convention on Nuclear Safety. The resolution noted "that in implementing the Convention, the U.S. government is encouraged to fully engage the U.S. industry through NEI and to include industry expertise through representation on the U.S. delegations to deliberations under the Convention."

The industry fully supports ratification of the Convention, and encourages the Administration as part of its implementation to ensure that appropriate input and involvement of the U.S. industry prior to, and possibly at, review meetings. U.S. ratification of the Convention should not impose any new regulatory requirements on the U.S. industry beyond those required to meet Nuclear Regulatory Commission (NRC) regulations.

Moreover, the Administration should not fund activities associated with implementation the Convention from user fees collected from NRC licensees for the agency's regulatory activities. Similarly, the Administration should eliminate existing governmental activities that are intended to achieve benefits that would be derived through the Convention.

Given the scheduled April 12, 1999 review meeting, NEI urges the Committee and the U.S. Senate to act promptly to ratify this Convention so that the United States can attend this first review meeting. U.S. leadership and participation is essential for successful implementation of the Convention, and given the importance of assuring safe operation of nuclear plants worldwide, it is clearly in the best interests of our nation and the world at large.

Mr. Chairman, the U.S. commercial nuclear industry is committed to achieving and maintaining a high level of safety at commercial nuclear power plants worldwide. The Convention provides an internationally accepted and reasonable framework for enhancing the already high levels of safety at commercial nuclear power plants in the United States and internationally.

Without nuclear energy, the United States and many other nations will find it impossible to meet increasing electricity demand, domestic clean air goals or global efforts to reduce the effects of carbon dioxide on the global climate. U.S. nuclear power plants provide clean air benefits while producing electricity at a competitive price with production costs that are a fraction of a cent higher than coal-fired electricity and more cost-effective than natural gas, solar or wind power. Members of Congress and other policymakers increasingly are recognizing the important benefits of nuclear energy to our economy, our environment and our energy future.

BACKGROUND

The United States has the largest commercial nuclear power industry in the world, and we are the global leaders in the development of advanced nuclear power plant technology. Between 1973 and 1996, nuclear energy met 40 percent of the increase in demand for electricity in the United States. Over this same period, U.S.

nuclear power plants displaced 2.3 billion barrels of oil, 3.4 billion tons of coal, and 12.1 trillion cubic feet of natural gas. The oil alone would have cost \$74 billion (in constant 1996 dollars). Worldwide, nuclear energy displaced 10 billion barrels of oil between 1973 and 1995, valued at over \$290 billion. During the same period, nuclear energy displaced 56 trillion cubic feet of natural gas and 8.9 billion tons of coal.

In 1997, nuclear energy generated more electricity—631 billion kilowatt hours in the United States than any other fuel source except coal. More than 100 nuclear power plants achieved an average capacity factor of 70.3 percent. (Capacity factor, a yardstick for plant performance, measures the amount of electricity actually produced compared with the maximum output achievable.) The 1997 average is nearly 16 percentage points higher than the 1980 average. Nationally, each percentage point increase in capacity factor is roughly equivalent to adding 1,000 megawatts of generating capacity to the electricity grid. Improved nuclear power plant performance thus helps meet the growing demand for electricity in the United States.

Since 1980, more than 40 U.S. nuclear power plants have entered service. The number of nuclear power plants in commercial service now stands at 103 up from 68 in 1980.

In providing one-fifth of U.S. electricity supply, nuclear energy is our nation's largest source of emission-free electricity. Nuclear energy also provides clean air benefits at a competitive price with production costs that are a fraction of a cent higher than coal-fired electricity and more cost-effective than natural gas, solar or wind power. Most U.S. nuclear power plants compete as low-cost electricity providers today and are well-positioned as states open their electricity markets to competition. Measured solely by economic factors—operating and maintenance costs plus fuel costs, ongoing capital requirements and general and administrative expenses—most nuclear units will be very competitive in a deregulated electricity market. In fact, many nuclear plants should be able to improve their economic performance even further.

Production costs at nuclear power plants in the last three years continue to fall well below those the nuclear energy industry incurred at the start of the decade. Meanwhile, plant performance measured by the capacity factor of plant operation has in the last two years reached record high levels.

The industry has built a solid record of safe, efficient performance at nuclear power plants as it enters a new business environment. But the industry's continued commitment to safe nuclear plant operation must be accompanied by the NRC's ability to fulfill its mission as a strong and credible regulator. Both are essential to build and maintain public trust and confidence in nuclear energy.

Unlike any other electric generation source, nuclear power is unique because the costs of the entire electricity production lifecycle—including the uranium fuel manufacturing process, NRC regulation, waste management and plant decommissioning—are included in the cost of electricity to consumers. To remain competitive with other generation sources that do not internalize many of these expenses, all costs in the nuclear fuel cycle must be appropriate and reasonable. Plants will close if they cannot compete, raising potential electricity system reliability problems. Moreover, the nuclear electric generation will be replaced by power plants that emit greenhouse gases and other air pollutants. If that scenario unfolds, the United States will find it impossible to meet increasingly stringent U.S. clean air regulations and international carbon dioxide reduction goals.

The foundation for the United States' leadership role in the nuclear energy industry is the extensive use of nuclear power in this country and the industry's improved safety performance. The industry's commitment to excellence in plant operations has resulted in dramatic gains in both safety and efficiency. Since 1985, for example, NRC data shows that the average number of significant events at U.S. plants has declined from nearly 2.5 per unit in 1985 to an average of .04 per unit in 1998. Moreover, improvements in nuclear plant operating efficiency since 1990 are equivalent to adding 11 large generating units to the national electric grid—further evidence of the industry's contribution to serving new electricity demand while meeting our nation's clean air goals.

Next week will mark the 20th anniversary of the accident at the Three Mile Island nuclear plant in Pennsylvania. Notwithstanding the reality that the accident hurt the nuclear energy industry's public image, the practical reality is that Three Mile Island was the catalyst for significant institutional and operational changes that translated into dramatic improvements in plant safety and efficiency.

Disciplines in training, operations and event reporting that grew from the lessons of the accident have made the nuclear power industry demonstrably safer and more reliable. During the 1980s, U.S. utilities committed to a major nuclear power plant improvement program. Its success is partly due to the initiatives of the Institute of

Nuclear Power Operations (INPO), an industry-sponsored organization that works to ensure the highest levels of safety and reliability in all aspects of nuclear plant operations.

Teams of qualified and experienced specialists visit each U.S. plant about every 18 months, but at least every 24 months. They perform a two-week examination of workers' performance, the condition of the plant systems and equipment, the plant's operating history, the quality of programs and procedures and the effectiveness of the management. The teams then report their findings to plant and corporate management—including recommendations for improvement—based on the best practices found in the nuclear industry worldwide.

Since 1983, INPO has collected performance data from each nuclear power plant and published annual industrywide performance indicators. This data helps utilities evaluate how well each plant is performing and sets specific goals for operating excellence.

As part of its program, INPO monitors 10 key performance indicators, such as unplanned automatic shutdowns and safety system actuations. INPO collects these data from each nuclear unit, then calculates national averages, and submits them to the World Association of Nuclear Operators (WANO). Each of WANO's performance indicators reveals that nuclear power plants are operating more safely, more productively and more competitively.

U.S. NUCLEAR REGULATORY REGIME IS A GLOBAL MODEL

The United States has the most mature commercial nuclear regulatory regime in the world. Within the context of exceptional plant performance, both the industry and the public still need and demand a credible and effective regulatory oversight process to ensure adequate protection of the public health and safety.

Although the Nuclear Regulatory Commission has been an effective regulator during the first decades of nuclear power plant operation, the agency has recognized the inherent value of changing the existing regulatory process to make it more effective and safety focused. In this new regulatory process, regulation must have a clear nexus to objective safety standards. The key to reform is in the efficient use of risk insights, which can greatly improve the safety focus of regulatory requirements. In conjunction with risk-informed regulation is a need for a performance-based approach, where the NRC would decide how best to meet those goals. Performance-based regulation is more sharply focused on safety than the current approach, because resources are applied to plant systems and components commensurate with their importance to safety.

The Nuclear Safety Convention would augment national regulatory programs, like the NRC, reaffirming the commitment to a high level of safety worldwide. U.S. leadership in international nuclear development has been critical to ensure safe, reliable and environmentally beneficial uses of commercial nuclear technology around the world. The United States has been a leader in technical exchanges with other nations that operate nuclear power plants. Together, industry leaders and plant operating personnel from the West and the East have recognized that nuclear power safety and operations transcend national boundaries. They have worked side by side with peers from all over the world to provide assistance and operating experiences.

Shirley Jackson, chairman of the Nuclear Regulatory Commission, said in a speech earlier this month that "nuclear operators long have recognized the value and the imperative of combining their national efforts in the cause of enhanced safety." Indeed, the United States has been extremely active in cooperative assistance efforts, including those designed to address the safety of Soviet-designed reactors in Central and Eastern Europe. The Convention on Nuclear Safety would augment International Atomic Energy Agency efforts in international safety. By ratifying the treaty, the United States would maintain U.S. leadership in ensuring that nuclear power plant designs in Eastern and Central Europe, as well as in developing countries, are safe. Although it does not address the full scope of global safety issues, the Convention promotes a nuclear safety culture worldwide by providing technical cooperation on safety-related issues.

U.S. participation in implementing the Convention on Nuclear Safety is an important component of providing this U.S. leadership. Importantly, the treaty will ensure that all contracting parties will report, for review, all measures they have taken to implement the safety obligations in the Convention. This reporting is thorough and is not subject to national confidentiality.

The Convention on Nuclear Safety establishes a framework for improving nuclear safety among all countries that operate nuclear power plants and provides a basis for dialogue with those countries planning to build and operate commercial nuclear facilities. The U.S. nuclear industry is committed to working with the United States

government on the Convention and urges U.S. companies to continue their long-standing assistance programs to improve efficiency, reliability and safety of nuclear power plants worldwide.

RESOLUTION

WHEREAS, thirty-three countries operating four hundred and forty-one nuclear power plants currently produce seventeen percent of the world's electricity;

WHEREAS, environmental benefits of nuclear energy, energy security considerations and economic factors, are causing many countries to pursue the expansion of their existing nuclear power programs, or the development of new nuclear power programs;

WHEREAS, the U.S. nuclear energy industry is committed to achieving and maintaining a high-level of nuclear safety at commercial nuclear power plants, worldwide; and

WHEREAS, the "Convention on Nuclear Safety" provides an internationally accepted and reasonable framework for enhancing the safety at commercial nuclear power plants worldwide;

NOW THEREFORE, BE IT RESOLVED,

that NEI encourages the prompt ratification of the "Convention on Nuclear Safety" by the Senate of the United States; and

that in implementing the Convention, the U.S. government is encouraged to fully engage the U.S. industry through NEI and to include industry expertise through representation on the U.S. delegations to deliberations under the Convention.

PREPARED STATEMENT OF GARY L. JONES

Mr. Chairman and Members of the Committee:

We are here today to provide information on the Convention on Nuclear Safety—a multilateral treaty to improve civil nuclear power safety. Our statement today summarizes (1) the Convention's scope and objectives, (2) the process for reviewing compliance with the Convention, (3) the dissemination of information related to the Convention's proceedings, and (4) the costs to implement the Convention. We have issued two reports that track the Convention's development and implementation.¹

In summary

- The Convention on Nuclear Safety, which focuses on civilian nuclear power reactors, is viewed by the United States as one of the chief policy instruments to encourage countries with Soviet-designed nuclear reactors to improve the safety of their reactors. The Convention seeks to achieve its safety objectives through countries' adherence to general safety principles, such as establishing an independent body to oversee safety, rather than binding technical standards. The Convention does not provide sanctions for noncompliance nor require the closing of unsafe nuclear reactors.
- The Convention's peer review process is intended to establish a forum where groups of countries will comment on reports that are self-assessments of their nuclear programs and thereby encourage countries to improve the safety of these programs. However, the Convention does not specify the form and content of the peer review process nor the quality of countries' reports; therefore, it is unclear how peer pressure will accomplish change or even whether sufficient information will be contained in the reports.
- Although public dissemination of information about the countries' progress in meeting the terms of the Convention can play a role in influencing compliance, it is uncertain how much information from the peer review meetings will be available to the public. Nuclear Regulatory Commission (NRC) officials told us that the Convention does not specifically provide for the kind of openness that they would prefer, but they believe that over time, more information will be made available to the public.
- In January 1997, we reported that the United States estimated that it could spend up to \$1.1 million through fiscal year 1999 to prepare for and attend the first review meeting. However, according to an NRC official, the actual costs for

¹*Nuclear Safety: Progress Toward International Agreement to Improve Reactor Safety* (GAO/RCED-93-153, May 14, 1993) and *Nuclear Safety: Uncertainties About the Implementation and Costs of the Nuclear Safety Convention* (GAO/RCED-97-39, Jan. 2, 1997).

this time period will be significantly less because U.S. officials have not participated in the full range of meetings and activities to date related to the Convention.

SCOPE AND OBJECTIVES OF THE NUCLEAR SAFETY CONVENTION

The development of the Nuclear Safety Convention is one of a number of cooperative efforts being undertaken by the international community to improve nuclear safety. The impetus for these efforts is based largely on the continuing concern about the safety of the older Soviet-designed reactors. Many of these reactors are operating without basic safety features, such as protective structures to contain radioactive releases and adequately trained personnel. Although the Convention is not viewed as a panacea or "quick fix," it is believed to be a positive step toward improving worldwide nuclear safety. Importantly, though, the Convention does not require any specific actions like closing unsafe nuclear reactors, and its focus is limited to civilian nuclear power reactors.

The Convention seeks to achieve its safety objectives through countries' adherence to general safety principles rather than binding technical standards. These principles include (1) establishing and maintaining a legislative framework and an independent regulatory body to govern the safety of nuclear installations; (2) establishing procedures to ensure that technical aspects of safety, such as the siting, design, and construction of nuclear power reactors, are adequately considered; and (3) ensuring that an acceptable level of safety is maintained throughout the life of the installations by such things as considering safety to be a priority and establishing a quality assurance program.

The majority of the country representatives that we met with during the early drafting stages of the Convention supported these principles. A few country officials stated, however, that without establishing procedures for addressing existing problem reactors, including time frames for upgrading their safety, the Convention would not improve nuclear safety. Nevertheless, 65 countries have signed the Convention, and 49 of the 65 have ratified it. As you know, the United States has signed but not ratified the Convention.

PEER REVIEW PROCESS IS CENTRAL TO THE CONVENTION'S SUCCESS

As noted, the Convention does not impose sanctions for noncompliance. Rather, it seeks to encourage compliance through a peer review process, which is considered central to the Convention's success. According to officials of the Departments of State and Energy and NRC, this process will enable countries' safety practices to be brought before the "bar of world public opinion." The Convention does not specify the form and content of the peer review process but calls on the parties to (1) submit self-assessment reports of the measures they have taken to implement the Convention and (2) hold meetings to review these reports. As you are aware, the first meeting of the parties will take place next month at the International Atomic Energy Agency (IAEA) in Vienna, Austria.

Review groups composed of members from participating countries serve as the foundation of the peer review mechanism. Each group includes members from several countries that have ratified the Convention. As the process is currently envisioned, the countries with the most operating nuclear reactors will participate in separate groups along with several other countries that have ratified the Convention. Within this group setting, all countries will critically examine and review how each country is complying with the Convention. Because the United States has not yet ratified the Convention, it has not yet been assigned to one of the country groups. In our 1997 report, we pointed out that NRC officials had expressed some concern about the potential grouping of countries. For example, the United States, which has spent tens of millions of dollars to improve the safety of Soviet-designed reactors, will not be in the same review group as Russia, which operates many of these reactors.

Although U.S. representatives had misgivings about the country peer review groups, the Convention states that each country shall have a reasonable opportunity to discuss and seek clarification of the reports of any other party at the review meeting. As a result, NRC officials believed that regardless of how the countries are ultimately grouped, the United States would have ample opportunity to review and comment on the self-assessment reports of all countries. According to NRC, the procedures on the peer review process have been clarified since the issuance of our 1997 report. The process will begin with discussions by group members but will then allow countries that are outside a particular group to obtain information of interest to them. Outside parties will be permitted to sit in on the full discussion of any report about which they have submitted questions or comments as observers. NRC be-

lieves this process will enable the United States' concerns about any country's report to be fully heard.

We would like to point out that this process is still somewhat theoretical and neither we nor anyone else can be fully certain that it will work precisely as described. Furthermore, it is unclear what form peer pressure will take and how it will cause changes in a country's nuclear power program. As we noted in our May 1993 report, overall responsibility for nuclear safety rests with the country where a nuclear installation is located.

Another issue that will affect the success of the peer review process is the quality of the individual countries' self-assessment reports, which are expected to describe how the parties are complying with the Convention. Because of differences in countries' nuclear safety programs and available resources, NRC officials anticipate unevenness in the quality and detail of the reports. In their view, this unevenness could affect the level of review and analysis. Similarly, an NRC official recently told us that there is no standard format for the reports and that quality issues will remain problematic.

PUBLIC ACCESS TO INFORMATION RESULTING FROM THE CONVENTION'S MEETINGS CAN INFLUENCE COMPLIANCE

The public dissemination of information about the countries' progress in meeting the terms of the Convention can play a key role in influencing compliance, according to some experts familiar with international agreements that rely primarily on peer review. Although U.S. and IAEA officials believe the Convention will encourage greater openness about many countries' safety records and programs, it is uncertain how much information resulting from the periodic meetings will be made available to the public. According to NRC officials, the countries can limit the distribution of their reports. While several countries have made the reports prepared for the first review meeting available to the public and even accessible on the Internet, an NRC official told us that one country, for example, has not made its report public. According to an NRC official, the United States plans to make its report publicly available.

Our 1997 report pointed out some concerns about what type of public record would result from the periodic meetings. We noted that the Convention provides for the public distribution of a report summarizing the issues discussed and the decisions reached during a meeting. However, an NRC official recently told us that the report will be generic in nature and unlikely to identify countries by name. Overall, NRC officials told us that the Convention does not specifically provide for the kind of openness that they would prefer but they believe that over time, more information will be made available to the public. Certainly, promoting greater openness about countries' nuclear safety regimes will enhance the credibility of the process.

COSTS TO IMPLEMENT THE CONVENTION

In January 1997, we reported that the United States estimated that it could spend up to \$1.1 million through fiscal year 1999 to prepare for and attend the first review meeting. However, according to an NRC official, the actual costs for this time period will be significantly less because U.S. officials have not participated in the full range of meetings and activities to date related to the Convention.

The Convention states that IAEA will bear the costs of administering the meeting of the parties, which were expected to total about \$1 million. Our 1997 report noted that IAEA planned to support the Convention through its operating budget, which the United States supports through an annual 25-percent contribution. NRC officials had told us that they were concerned about IAEA's potential costs for administering the Convention. The factors affecting IAEA's costs primarily involve the number of languages used to conduct the meeting of the parties and the corresponding translation services. Recently, though, an NRC official told us that costs are being contained because English will serve as the working language for the meeting of the parties. If more languages had been used, then the costs would have been higher given the corresponding costs for translation. As noted in our 1997 report, IAEA's then Deputy Director General for Nuclear Safety told us that the Convention might uncover additional safety problems that require attention. As a result, the countries with the most acute safety problems may seek to use the Convention process as leverage to obtain additional nuclear safety assistance.

This concludes our statement. We would be happy to respond to any questions you or other Members of the Committee may have.

[Attachments.]

[GAO Report to Congressional Requesters—May 1993]

NUCLEAR SAFETY—PROGRESS TOWARD INTERNATIONAL AGREEMENT TO IMPROVE
REACTOR SAFETY

U.S. GENERAL ACCOUNTING OFFICE,
RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION,
Washington, DC, May 14, 1993.

The Honorable JOSEPH I. LIEBERMAN, *Chairman,*
Subcommittee on Clean Air and Nuclear Regulation,
Committee on Environment and Public Works,
United States Senate

The Honorable BOB GRAHAM,
United States Senate

Representatives of nearly one-half of the 114 member states of the International Atomic Energy Agency (IAEA), including the United States, have participated in the development of an international nuclear safety convention—a proposed multilateral treaty to improve civil nuclear power reactor safety. A preliminary draft of the convention has been developed (referred to as the draft convention for this report), but discussions are continuing, and when the final convention text will be completed and presented to IAEA member states for signature is uncertain.

This report responds to the former and current Chairman's request that we provide information on the development of the nuclear safety convention, including a discussion of (1) the draft convention's scope and objectives, (2) how the convention will be implemented and monitored, (3) the views of selected country representatives on what provisions should be included in the draft convention, and (4) the convention's potential benefits and limitations.

RESULTS IN BRIEF

The scope of the convention as currently drafted focuses on civil nuclear power reactors. Thus, other nuclear facilities, including those dealing with waste management, military activities, fuel cycle activities—such as reprocessing and/or enrichment plants—and research reactors, are not covered under the convention's provisions. For example, the draft convention would not cover the nuclear reprocessing facility at a military complex in Russia where an accident occurred in April 1993.

The objectives of the draft convention are written in general terms and call on countries to achieve and attain a high level of safety to prevent nuclear accidents. Because the convention's premise is that the regulation of nuclear safety is a national responsibility, safety goals would be achieved through countries' adherence to general safety principles, such as establishing a legislative framework and an independent regulatory body to govern the safety of nuclear installations, rather than to binding detailed technical standards. The convention has been characterized as incentive-oriented, designed to encourage widespread support, particularly among countries operating Soviet-designed reactors that lack basic safety features.

The draft convention provides for a peer review process to monitor adherence to the provisions of the convention. Through this process—the details of which have not been determined—it is envisioned that country representatives would have an opportunity to review other countries' measures to improve safety and could exert peer pressure to affect changes.

Although the convention concept is supported by a diverse group of IAEA member state representatives, views differ regarding several issues. For example, the United States and 6 other country representatives told us that they favor a scope limited to civil nuclear power plants, while 16 country representatives told us that they support a broader convention covering, for example, radioactive waste facilities or reprocessing facilities in addition to power plants. One country did not provide a final position on the scope of the convention. Representatives from 21 of the 24 IAEA member states that we met with, including U.S. officials, told us that they favor a convention based on general safety principles and oppose an international enforcement mechanism because the safe operation and maintenance of nuclear reactors is a national responsibility. Most of these countries operate nuclear power plants. Representatives we spoke with from three countries—none of which operate civil nuclear power plants but do neighbor countries operating nuclear power plants—prefer binding technical standards and an international regulatory body to oversee the convention's implementation.

The majority of country representatives and some IAEA officials believe the convention is a positive step towards promoting and strengthening international nuclear safety and perhaps increasing public confidence in the nuclear power industry. However, a few other representatives and other IAEA officials were less optimistic. They noted that without establishing procedures for addressing existing problem reactors, including time frames for upgrading their safety, the convention will not improve nuclear safety. In addition, they told us that the convention could easily be considered weak and lacking in substance by nuclear poweropponents; thus, unless the convention addresses those reactors where perceived safety deficiencies exist, it is technically flawed.

BACKGROUND

The development of the nuclear safety convention is one of a number of cooperative efforts being undertaken by the international community to improve nuclear safety. Financial and technical assistance from various bilateral and multilateral sources, such as the Commission of the European Communities, is under way to address some of the most urgent safety problems. The impetus for these efforts is based largely on the growing concern about the safety of the older Soviet-designed reactors in eastern Europe and the former Soviet Union. Many of these reactors are operating without basic safety features, such as emergency core cooling systems, protective structures to contain radioactive releases, and adequately trained personnel. In addition, many of these reactors are in countries that do not have independent or effective nuclear regulatory organizations.

The IAEA member state representatives developing the draft convention, known collectively as the working group, have met three times in Vienna, Austria, during the period May 1992 through January 1993. The Department of State heads the U.S. delegation to the working group, which also includes representatives from the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC). The group plans to meet again in May 1993. A State Department official told us that discussions have been complex and difficult because the convention concerns the sovereign rights of nations to regulate and manage important domestic industrial activities that will be affected by the provisions of the convention when adopted. As a result, according to the State Department official, a diplomatic conference will be necessary to negotiate the final terms of the convention.

SCOPE AND OBJECTIVES OF THE DRAFT CONVENTION

The scope of the convention, as currently drafted, applies only to civil nuclear power plants. Thus, other nuclear facilities, including those dealing with waste management, military activities, and fuel cycle activities—such as reprocessing and/or enrichment plants—and research reactors, are not covered by the terms of the convention. The convention as it currently exists would not cover, for example, the nuclear reprocessing facility at a military complex in Russia where an accident occurred in April 1993.

The objectives of the draft convention are written in general rather than detailed, technical, and prescriptive terms. For example, the convention calls on countries to take all appropriate measures to (1) protect people and the environment from the harmful effects of radiation and (2) prevent the occurrence of nuclear accidents. The convention proposes that countries cooperate to reach these objectives and achieve and maintain a high level of nuclear safety. The convention does not seek to impose penalties for noncompliance.

The convention has been described as incentive-oriented designed to maximize the number of countries that will support and sign it. A State Department official said that a major reason for developing an incentive-type convention was to make it acceptable and useful to countries with problem reactors, particularly the former Soviet Union and eastern European nations. According to U.S. officials, the main purpose of the convention is to get these countries, as well as developing nations, to make commitments to improve their reactors and develop a safety culture.¹ The U.S. officials believe that these countries probably would not sign a prescriptive or stringent convention that they could not comply with.

The draft convention states that overall responsibility for nuclear safety rests with the country where a nuclear installation is located. Therefore, the convention seeks to achieve its objectives through countries' adhering to general safety principles rather than to binding technical standards. These principles, or safety fun-

¹Safety culture implies individual and organizational awareness of and commitment to the importance of safety. It also refers to the personal dedication and accountability of all individuals engaged in any activity that has a bearing on the safety of nuclear power plants.

damentals, embodied in the draft convention represent international consensus by experts on basic safety concepts for the regulation and operation of nuclear installations. The principles comprise the most general level of guidelines in the hierarchy of IAEA's nuclear safety series publications.²

The principles, in part, call on each country to take the following actions:

- Establish and maintain a legislative framework and independent regulatory body to govern the safety of nuclear installations through regulations, licensing, inspection, and enforcement.
- Establish procedures to ensure that technical aspects of nuclear reactor safety are adequately considered and continuously evaluated throughout the life of the installation. These technical aspects include siting, design and construction, and operation and maintenance. For example, countries would be required to establish procedures to evaluate the impact of a nuclear installation's site selection on the environment and ensure that the design of the installation provides for levels of protection against the release of radioactive materials.
- Establish a safety management system to ensure that an acceptable level of safety is maintained throughout the life of the installation. This is to be achieved by giving priority to safety, establishing a quality assurance program, ensuring that staff are adequately trained, performing periodic safety assessments, and establishing an emergency preparedness plan.

CONVENTION TO BE IMPLEMENTED BY PEER REVIEW PROCESS

As currently drafted, the convention would be implemented by periodic meetings of the signatory countries—a peer review process. Although the details of this process have not been determined by the working group, the draft convention contains proposals that the meetings will (1) establish the structure, content, and time frames for status reports to be submitted by the signatory countries; (2) review and assess how the countries are meeting the convention's obligations; and (3) carry out advisory functions to achieve and maintain a high level of nuclear power plant safety.

These meetings are an essential element of the convention and should provide a forum for reviewing countries' measures to improve safety. At a February 1993 IAEA general conference meeting, the U.S. representative noted that the convention should establish a mandatory process for exerting peer pressure on countries with weak nuclear safety programs to substantially improve them.

The role of IAEA—an agency that promotes improvements in nuclear power reactor safety—in implementing the convention has not been agreed upon, but it is unlikely that the agency will have any enforcement or regulatory responsibility. As drafted, the convention proposes that IAEA serve as the Secretariat to the meeting of the parties. In this capacity, IAEA would (1) convene, prepare, and service the meetings; (2) transmit reports and information to member countries; and (3) perform other duties and provide support services and technical expertise as requested. Most of the country officials, including the U.S. delegation, believe that IAEA also can play a useful, nonregulatory role in implementing the convention, such as technical adviser.

Both the Director and Deputy Director of IAEA's Nuclear Safety Division believe the agency can play an active role by more fully utilizing the skills and expertise of the agency. They noted that in addition to the proposed Secretariat role, IAEA could facilitate the procedural meetings of the parties in a variety of ways. For example, IAEA could (1) prepare reports for the meetings, (2) analyze countries' status reports, (3) verify countries' progress in improving safety, (4) establish criteria to serve as a benchmark for measuring progress in meeting the convention's obligations, and (5) provide other technical assistance as required.

COUNTRY REPRESENTATIVES EXPRESSED DIFFERING VIEWS ON NUCLEAR SAFETY CONVENTION

We interviewed representatives of 24 IAEA member state countries³—18 of which operate 87 percent of the world's civil nuclear power plants—to obtain their views on the convention's scope, whether they favored a convention based on detailed technical standards or general safety principles, if there should be a mechanism to en-

²IAEA's safety series also includes more detailed standards, guides, and practices. In total, these guidelines provide a reference for developing national safety regulations in certain cases.

³We interviewed representatives from Argentina, Austria, Belgium, Brazil, Bulgaria, Canada, China, Cuba, Finland, France, Germany, Ireland, Italy, Japan, Republic of Korea, Mexico, Netherlands, Portugal, Romania, Russian Federation, Spain, Sweden, United Kingdom, and the United States.

sure adherence to the convention, and the convention's potential benefits and limitations.

Mixed Views on Scope of Convention

Various views exist among country representatives over what facilities and elements of the nuclear fuel cycle should be included in the convention. All of the representatives we spoke with agreed that, at a minimum, the convention should cover civil nuclear power plants. However, the majority of these representatives told us that the final convention should not be limited to these installations. Of the 24 representatives, 16 favored a convention covering a wider range of facilities and most frequently cited the need to include radioactive waste disposal. Other facilities or elements mentioned were fuel reprocessing, transportation of nuclear material, military facilities, and research reactors. One country representative did not provide a final position on the scope of the convention.

Representatives told us that a nuclear accident, regardless of its source, is potentially dangerous. In their view, a convention addressing other sources of radiation would demonstrate the international community's recognition of the broader issues involving nuclear safety. Many of the representatives who support a broader scope for the final convention told us that their countries might be willing to accept a convention limited to nuclear power plants as a first step, with the understanding that additional nuclear facilities would be addressed in future conventions.

Seven country representatives, including the United States, favor a scope limited to nuclear power reactors, in part because they pose the most serious risk. In addition, State Department and NRC officials told us that it was thought early agreement could be reached on a final text of the convention if it was limited to nuclear power reactors. In addition, an NRC official told us that the United States is committed to continuing the convention process and would be an active participant in any future safety conventions addressing other nuclear facilities.

Most Countries Favor General Principles Over Binding Standards

Of the 24 countries whose representatives we interviewed, including the United States, 21 support a convention based on general safety principles, not binding safety standards. With one exception, these countries have nuclear power plants in operation or under construction. Several member country representatives said that the general principles included in the draft convention are adequate to establish minimum acceptable standards of safety. Officials from the United States and several other countries noted that standards could infringe on national sovereignty or conflict with national laws and policies. A DOE official said that detailed standards are not well suited for development into international standards. He said that the diversity of plants in operation worldwide and of those planned for the future makes it difficult for a set of detailed standards to be applied broadly and still to provide recognition of individual reactor design requirements.

The representatives of the United States and other countries told us that it would be time-consuming and complex to translate safety standards into acceptable binding international language. Furthermore, the United States has maintained that international standards could commit the signatory countries to a less rigorous set of obligations than many national programs have adopted—a "lowest common denominator" approach to nuclear safety.

Representatives from three non-nuclear power countries, all of which neighbor countries with operating nuclear power reactors, told us that they favor a convention based on binding international technical safety standards. Officials from these countries said that detailed, prescriptive standards would provide firm obligations and serve as criteria for measuring progress made toward nuclear safety. Two of these countries' officials disagreed with the lowest common denominator argument made by the United States. The officials said that the Western nations already exceed the proposed international nuclear safety standards. Furthermore, the officials believe that standards are necessary to bring countries with problem reactors up to minimum acceptable levels of safety.

While most countries do not favor a convention based on binding standards, working group delegates are debating the value of using standards as a reference to measure countries' progress toward improving safety. Various countries in the working group favor using international standards for this purpose. Furthermore, some representatives that were opposed to a convention based on technical standards supported the idea of using standards for the peer review process. The U.S. delegation was among several countries opposed to this idea, especially if the standards were to be assigned special recognition in the convention. The United States based its opposition, in part, on the belief that experience and expertise in operating nuclear reactors are the key to the peer review process, not standards. At the last working

group meeting in January 1993, no agreement was reached on what role, if any, standards should play.

Most Countries Oppose International Enforcement or Regulatory Body

Representatives of 21 countries, including the United States, told us that they are opposed to having an international organization, such as IAEA, enforce the convention. The same countries that favor general principles over technical standards oppose international enforcement for many of the same reasons. These countries are opposed to a regulatory body, primarily because they believe it would infringe upon their national sovereignty.

Several country representatives told us that countries with problem reactors would be discouraged from signing an enforcement-oriented convention. In their view, these countries should be part of the process if the convention is going to have a positive impact on improving international nuclear safety. Representatives from three non-nuclear power countries told us that enforcement and verification procedures are essential to ensure that countries are meeting their obligations. Furthermore, two of these countries favor mandatory international inspections, possibly by IAEA.

POTENTIAL BENEFITS AND LIMITATIONS OF THE PROPOSED NUCLEAR SAFETY CONVENTION

The nuclear safety convention concept enjoys broad support among a diverse group of countries. Although many member country representatives do not view the convention as a panacea or quick fix, the majority believe it is a positive step toward improving international nuclear safety. A U.S. government representative said that the convention's primary benefits would be (1) promoting a nuclear safety culture and (2) obtaining improvements in nuclear reactors located in eastern Europe, the former Soviet Union, and developing countries. Various member country representatives said that, in addition to promoting a global safety culture, the convention could increase public awareness and confidence in nuclear safety. Some IAEA officials, who are assisting in the working group, believe the convention is a worthwhile effort because it will bring countries together to discuss safety issues as part of a systematic process.

A few primarily non-nuclear power countries, as well as some IAEA officials, believe that the proposed convention has serious limitations. One country representative said that the convention needs to change the status quo and improve the safety of problem reactors. However, in his view, the draft convention would not achieve this objective. A few member country officials noted that without establishing procedures for addressing existing problem reactors, including time frames for upgrading their safety, the convention would not improve nuclear safety. The Director of IAEA's Division of Nuclear Safety told us that the convention could easily be considered weak and lacking in substance by nuclear power opponents. The Deputy Director noted that unless the convention addresses those reactors where perceived safety deficiencies exist, it is technically flawed.

OBSERVATIONS

Development of the draft international nuclear safety convention has been complex and difficult. This is understandable, given the various perceptions and expectations of countries as to what a nuclear safety convention should contain and what it should accomplish. Agreement has not been reached on the substantive provisions regarding the scope and the level of technical detail of safety standards or principles to be adhered to by member countries.

The sovereign rights of participating countries could be affected by the final convention document. Although member states differ on the elements that the convention should contain, they share the common goal of wanting to improve nuclear power reactor safety through greater international cooperation. The member states also seem to agree that safety is an international responsibility because of the potential transboundary effects of radiation released from an accident.

It is premature to assess the impact of the nuclear safety convention, the success of which depends on many factors, including getting most of the nations with nuclear power plants to sign onto the convention and adhere to its terms. However, some preliminary observations can be made at this time. The draft convention does not provide measurable criteria to gauge the safety improvements of the countries, particularly those with problem reactors. Using benchmark criteria in the peer review process could aid in assessing and monitoring progress in upgrading the safety of civil nuclear power plants. In addition, although it is clear that most member state representatives do not envision an enforcement role for IAEA, it is not clear

what role IAEA will ultimately serve. IAEA's technical expertise and safety services could be used to facilitate the peer review process.

AGENCY COMMENTS

We discussed the facts presented in this report with the State Department's Director, Office of Nuclear Technology and Safeguards; NRC's Deputy Director, Office of Nuclear Regulatory Research; DOE officials in the Office of the Assistant Secretary for Domestic and International Energy and in the Office of General Counsel; and the Counselor of Nuclear Policy, U.S. Mission to the United Nations System Organizations. We discussed the report with the following officials from IAEA's Division of Nuclear Safety: the Director, the Deputy Director, and the Head of the Safety Standards and Coordination Section. We also met with officials from IAEA's Legal Division.

In general, these officials agreed with the facts presented in this report and gave us additional clarifying information. We have revised the text as necessary. However, as requested, we did not obtain written agency comments on a draft of this report.

SCOPE AND METHODOLOGY

To obtain a broad range of views on the nuclear safety convention, we judgmentally selected 24 IAEA member countries to include in our review. As of December 31, 1992, 18 of the 24 countries operated 87 percent of the world's nuclear power plants. Among this group of countries, we wanted to ensure that we solicited the views of representatives from both highly industrialized and less-developed countries. We obtained the views of some of those countries with Soviet-designed reactors, such as the Russian Federation and Bulgaria. We also sought views from two countries that do not currently operate civil nuclear power plants but are constructing them—Cuba and Romania.

Finally, we met with representatives from four countries that do not currently have active civil nuclear power programs—Austria, Ireland, Italy, and Portugal. We selected these countries to ensure that we included the views of non-nuclear power countries that neighbor countries operating civil nuclear power plants.

We met with officials from all of these countries to obtain their views on the draft convention. These officials included country representatives to IAEA, legal and technical experts, and other knowledgeable government officials. Whenever possible, we sought to verify foreign countries' positions by comparing their representatives' views with formal statements provided at IAEA general conferences and other available information. We provided officials from each country with a summary of information and requested that it be reviewed by other cognizant government representatives for accuracy and completeness. Representatives from all 23 foreign countries responded between December 1992 and March 1993. One country's positions were presented as preliminary and subject to further review.

To obtain the views of the U.S. government, we met with officials from the Departments of State and Energy and NRC. We also met with officials from the U.S. Mission to the United Nations System Organizations, Vienna, Austria; and the U.S. Mission to the European Communities, Brussels, Belgium. We obtained pertinent documents that detailed U.S. positions on the safety convention.

To help identify key elements and objectives of the convention, we attended the October 1992 and January 1993 sessions of the nuclear safety working group in Vienna, Austria. We reviewed pertinent convention-related reports prepared by IAEA and other relevant documentation prepared by the participating countries. We also obtained the views of officials and additional documentation from IAEA the Paris, France, Center of the World Association of Nuclear Operators; the Nuclear Energy Agency of the Organization for Economic Cooperation and Development; and the Commission of the European Communities.

We performed our review between August 1992 and March 1993 in accordance with generally accepted government auditing standards.

VICTOR S. REZENDES,
Director, Energy and Science Issues.

APPENDIX I

COUNTRIES ATTENDING THE NUCLEAR SAFETY CONVENTION WORKING GROUP

Country	Operating civil nuclear power reactors	Civil nuclear power reactors under construction	Not operating civil nuclear power reactors
Algeria			X
Argentina	X	X	
Australia			X
Austria			X
Belgium	X		
Brazil	X	X	
Bulgaria	X		
Canada	X	X	
China	X	X	
Croatia ¹			X
Cuba		X	X
Czech Republic ²	X	X	
Denmark			X
Egypt			X
Finland	X		
France	X	X	
Germany	X		
Greece			X
Holy See			X
Hungary	X		
India	X	X	
Indonesia			X
Iran		X	X
Ireland			X
Israel			X
Italy			X
Japan	X	X	
Republic of Korea	X	X	
Luxembourg			X
Malaysia			X
Mexico	X	X	
Netherlands	X		
Nigeria			X
Norway			X
Pakistan	X		
Peru			X
Philippines			X
Poland			X
Portugal			X
Romania		X	X
Russian Federation	X	X	
Saudi Arabia			X
Slovak Republic ²	X	X	
Slovenia ¹	X		
South Africa	X		
Spain	X		
Sweden	X		
Switzerland	X		
Thailand			X
Tunisia			X
Turkey			X
Ukraine	X	X	
United Kingdom	X	X	
United States	X	X	

Note: Not all countries listed attended all meetings of the working group.

¹ Yugoslavia attended the May 1992 meeting. Two former Yugoslavian republics of Slovenia and Croatia attended the later meetings.

² Czechoslovakia attended the 1992 meetings. Following the dissolution of Czechoslovakia on December 31, 1992, the Czech and Slovak Republics attended the January 1993 meeting.

Source: IAEA, December 31, 1992

[GAO Report to Congressional Requesters—January 1997]

NUCLEAR SAFETY—UNCERTAINTIES ABOUT THE IMPLEMENTATION AND COSTS OF THE
NUCLEAR SAFETY CONVENTION

U.S. GENERAL ACCOUNTING OFFICE,
RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION,
Washington, DC, January 2, 1997.

The Honorable JESSE HELMS, *Chairman,*
Committee on Foreign Relations,
United States Senate

The Honorable BOB GRAHAM,
United States Senate

The 1986 explosion of the Chernobyl nuclear power reactor in Ukraine underscored the global importance of nuclear safety, as radioactive material was carried beyond the national boundaries of the Soviet Union to East and West European countries. In the aftermath of the Chernobyl accident, representatives of over 50 nations participated in the development of a Convention on Nuclear Safety, a multilateral treaty that seeks to increase the safety of civil nuclear power reactors. As of December 1996, the Convention had been signed by 65 countries, including the United States. The Secretary of Energy signed the Convention on behalf of the United States in September 1994. However, in order for the United States to become legally bound by the Convention, the U.S. Senate must ratify it. In May 1995, the administration transmitted the Convention to the Senate, but the Senate has yet to take action. (See app. I for a list of countries that have signed—or signed and ratified—the Convention.)

As requested, this report provides information on (1) how compliance with the Convention's terms and obligations will be reviewed by the ratifying countries (hereinafter, also called parties) and (2) the potential costs to the United States to participate in the Convention.

RESULTS IN BRIEF

The method to review compliance with the Convention on Nuclear Safety has not been finalized. The Convention does not impose sanctions for noncompliance but seeks to encourage compliance through peer pressure. The Convention relies on each ratifying country to prepare a self-assessment report of its nuclear power program. These reports will, in turn, be reviewed by other member countries at periodic meetings to determine how each country is complying with the Convention. The level of detail to be included in these reports has not been finalized, nor has the process by which countries will critically review these reports been fully determined.

As the method is currently envisioned, groups composed of five or six countries would form the core of the review process. The countries with the greatest number of operating nuclear reactors—the United States, France, Japan, the United Kingdom, and Russia—would participate in separate review groups made up primarily of several other countries with operating reactors. Although U.S. government officials did not originally favor the country-grouping approach, they believe the United States will have adequate opportunities to review the safety programs of all countries through other mechanisms established by the Convention.

The costs associated with the United States' participation in the Convention have not been fully determined. The Nuclear Regulatory Commission, the Department of State, and the Department of Energy have estimated that it could cost as much as \$1.1 million to (1) participate in planning meetings to develop the Convention's policies and procedures; (2) prepare the first U.S. self-assessment report; (3) review other countries' reports; and (4) participate in the first review meeting, which will probably be held in April 1999. These costs are made up primarily of U.S. government-related salaries and benefits. Other costs—a portion of which the United States will incur—associated with the International Atomic Energy Agency's administration of the Convention are less certain but could range up to \$10.3 million through the first review meeting, according to a 1993 estimate. Nuclear Regulatory Commission officials believe, however, that the actual costs will be significantly less—about \$1 million to administer the first review meeting. The costs for subsequent review meetings have not been estimated.

BACKGROUND

The Convention on Nuclear Safety, which became effective for the ratifying countries on October 24, 1996,¹ seeks to achieve and maintain a high level of safety for all nations that operate civil nuclear power reactors. (According to the International Atomic Energy Agency [IAEA], as of December 31, 1995, 32 countries operated 437 nuclear power reactors.) The U.S. government views the Convention as one of the chief policy instruments to encourage Russia and other countries with reactors that do not meet Western safety standards to improve safety. The Convention calls on countries to take action to, among other things, (1) establish and maintain a legislative framework and independent regulatory body to govern the safety of nuclear installations; (2) establish procedures to ensure that technical aspects of safety, such as the siting, design, and construction of nuclear power reactors, are adequately considered; and (3) ensure that an acceptable level of safety is maintained throughout the life of the installations by such things as giving a priority to safety, providing adequate financial resources, and establishing a quality assurance program.

The Department of State, the Department of Energy (DOE), and the Nuclear Regulatory Commission (NRC) have participated in the development and implementation of the Convention.² NRC, in its capacity as the U.S. civilian nuclear regulatory authority, will play a central role in implementing U.S. obligations under the Convention. The Convention establishes IAEA as the Convention's secretariat primarily to (1) convene and prepare for the meetings and (2) transmit reports and information to member countries.

PROCESS TO REVIEW COMPLIANCE HAS NOT BEEN FINALIZED

The method to review countries' compliance with the Convention has not been finalized. The Convention relies on the ratifying countries to prepare reports (self-assessments of their nuclear power programs) that are expected to describe how they are complying with the Convention. However, the reports' level of detail and specifics and the process for examining the reports have not been fully determined. Although U.S. and IAEA officials believe the Convention will encourage openness about countries' safety programs, it is uncertain how much information will be made available to the public.

Peer Review Process Is Central to the Convention's Success

The Convention does not impose sanctions for noncompliance but seeks to encourage compliance through peer pressure. To determine compliance with the terms of the Convention, countries are required to meet periodically to review one another's safety programs.³ State, DOE, and NRC officials have stated that this peer review process is central to the Convention's success, noting that it will enable the countries' safety practices to be brought before the "bar of world public opinion."

The Convention does not specify the form and content of the peer review process but calls on the parties to (1) submit self-assessment reports of the measures they have taken to implement the Convention and (2) hold meetings to review these reports. Representatives of over 40 countries, including the United States, have met on several occasions over the past 2 years to develop options for implementing the peer review process. The United States has chaired these sessions. In June 1996, the representatives agreed on a model to implement the peer review process, but final decisions will not be made until all of the ratifying countries meet no later than April 1997, as required by the Convention.⁴

As the process is currently envisioned, the five countries with the most operating nuclear reactors—the United States, France, Japan, the United Kingdom, and Russia—would participate in separate groups made up of several other countries that have ratified the Convention. The remaining countries are placed in each group on the basis of the number of reactors in each country, as shown in table 1. Within

¹Under the terms of the Convention, any country that ratifies the Convention subsequent to October 24, 1996, must wait 90 days to participate in it.

²See our report entitled *Nuclear Safety: Progress Toward International Agreement to Improve Reactor Safety* (GAO/RCED-93-153, May 14, 1993) for more information about the development of the Convention.

³The Convention requires that the first meeting of the parties to review the self-assessment reports occur within 30 months of the Convention's entry into force, which means not later than April 24, 1999. Subsequent meetings are to be held at intervals not to exceed 3 years.

⁴Because the Convention provides that a country must wait 90 days after ratification, the United States would not be entitled to participate in the April 1997 meeting unless it ratified the Convention by January 24, 1997. NRC officials told us that it is likely that some form of informal participation could be arranged, however, if the United States ratified before the April meeting.

this group setting, all countries would critically examine and review how each country is complying with the Convention. IAEA officials told us that the country-review groups form the core of the peer review process.

TABLE 1.—POSSIBLE GROUPING OF COUNTRIES FOR THE PEER REVIEW PROCESS

Group	Countries (number of reactors)						
A	United States (109)	Republic of Korea (11)	India (10)	China (3)	Argentina (2)	Armenia (1)	Italy (0)
B	France (56)	Sweden (12)	Spain (9)	Slovak Republic (4)	Lithuania (2)	Slovenia (1)	Romania (0)
C	Japan (51)	Ukraine (16)	Belgium (7)	Hungary (4)	Mexico (2)	Pakistan (1)	Cuba (0)
D	United Kingdom (35)	Germany (20)	Bulgaria (6)	Finland (4)	The Netherlands (2)	Kazakhstan (1)	Philippines (0)
E	Russia (29)	Canada (21)	Switzerland (5)	Czech (4)	South Africa (2)	Brazil (1)	

Note: Numbers in parentheses show the total number of reactors operating in the country as of December 31, 1995. The table assumes that all of the countries had ratified the Convention.

Source: June 1996 Meeting of the Signatory Countries to the Convention on Nuclear Safety and IAEA.

NRC officials have expressed some concern about the potential grouping of countries. In their view, this approach may not provide the most meaningful, professionally technical review. For example, the United States, which spent about \$89 million through March 1996 to improve the safety of Soviet-designed reactors, would not be in the same review group as Russia or Ukraine, countries that operate the majority of these reactors. In addition to its ongoing safety assistance program, the United States also has significant technical expertise and years of practical experience working to improve the safety of these reactors and improve these countries' civilian nuclear regulatory capabilities.

The United States had earlier supported a different approach in which each country's self-assessment would be reviewed by separate subject matter committees. This review would be based on three main elements of the Convention: (1) governmental organization; (2) siting, design, and construction; and (3) operations. The U.S.-favored approach was replaced by the country-grouping model proposed by France and the United Kingdom. Representatives of these countries maintained that the smaller groups of countries would allow for a more thorough and unified review of a country's report than would a functional review of part of a country's report, as initially envisioned by the United States.

The Convention states that each country shall have a reasonable opportunity to discuss and seek clarification of the reports of any other party at the review meeting. As a result, NRC and IAEA officials believe that regardless of how the countries are ultimately grouped, the United States will have ample opportunity to review and comment on the self-assessment reports of all countries.⁵ For example, according to NRC and IAEA officials, countries may be permitted to participate in other groups' meetings as observers and discuss their concerns in supplemental meetings. Countries are also expected to have opportunities to comment on the self-assessment reports at general sessions held during the review meeting.

The detail and specifics of the self-assessment reports—which serve as the basis for the meeting of the parties—have not been finalized. These reports are expected to describe how the parties are complying with the Convention. Because of the differences in countries' nuclear safety programs and available resources, NRC officials anticipate an unevenness in the quality and detail of the reports. In their view, this

⁵ According to the June 1996 "Draft Guidelines Regarding the Review Process Under the Convention on Nuclear Safety," the self-assessment reports of all countries will be submitted to IAEA 6 months prior to the first review meeting. Each country may send questions and comments on any report to the coordinators of the relevant groups up to 2 months before the first meeting. The coordinators would then distribute the comments to all parties to the Convention.

unevenness could affect the level of review and analysis. U.S. officials also stated that the countries with a significant number of nuclear installations may produce a generic rather than a plant-specific report.

Public Access to Convention's Proceedings Is Unclear

The public dissemination of information about the countries' progress in meeting the Convention's obligations can play a key role in influencing compliance, according to some experts familiar with international agreements that rely primarily on peer review. Although U.S. and IAEA officials believe the Convention will encourage greater openness about many countries' safety records and programs, it is uncertain how much information resulting from the periodic meetings will be made available to the public. According to NRC officials, the countries can limit the distribution of their reports. These officials noted, however, that the United States plans to make its report available to the public.

Although the Convention provides for the public distribution of a report summarizing the issues discussed and decisions reached during the review meeting, preliminary information indicates that this report is unlikely to identify any country by name. IAEA officials told us that they do not expect this report to provide detailed information about the key issues addressed during the review meeting.

According to IAEA, the Convention explicitly prohibits nongovernmental organizations from participating in the meetings. NRC officials told us however that these organizations, such as public advocacy or industry groups, might participate as members of their national delegation or be called upon to review and comment on self-assessment reports. U.S. nuclear industry representatives told us that they would like to assist in developing the U.S. report and participate in the meeting of the parties. NRC officials acknowledged that the Convention does not specifically provide for the kind of openness they would prefer, but they believe that over time, more information will be made available to the public through the Convention process.

COSTS TO IMPLEMENT THE CONVENTION HAVE NOT BEEN FULLY DETERMINED

To prepare for and attend the first review meeting in 1999, the United States estimates it could spend as much as \$1.1 million. As the Convention's secretariat, IAEA will also incur costs to administer these meetings. IAEA's costs, which the United States will partially fund, have not been fully identified but could range as high as about \$10 million, according to a 1993 estimate. NRC officials told us that they believe IAEA's costs will be significantly less—about \$1 million.

U.S. Costs to Implement the Convention

The United States estimates that it could spend between \$700,000 and \$1.1 million through fiscal year 1999 to prepare for and attend the first review meeting, which is expected to be held in April 1999. Additional costs to participate in subsequent review meetings, which are expected to be held every 3 years, have not been estimated. Officials from NRC, State, and DOE told us that the costs associated with the first review meeting are based on (1) participating in four planning meetings held between December 1994 and June 1996 to develop the Convention's draft policies and procedures, (2) preparing the first U.S. self-assessment report, (3) reviewing other countries' reports, and (4) participating in the April 1997 preparatory meeting and the first review meeting. The agencies' estimated costs include the existing and planned travel costs associated with attending meetings at IAEA headquarters in Vienna, Austria, and salary and benefit costs related to the time spent preparing for these meetings. Figure 1 shows the breakdown of estimated costs by agency through the first meeting of the parties.

U.S. Government's estimated costs to implement the Convention on Nuclear Safety through 1999:

- Department of State \$42,000 (4 percent)
- Department of Energy \$124,000 (11 percent)
- Nuclear Regulatory Commission \$954,000 (85 percent)

Note 1: These costs include \$99,500 actually expended in fiscal years 1995 and 1996.

Note 2: These costs are based on a high range of costs projected, as discussed in app. II.

Sources: NRC, DOE, and State.

Salary and benefits constitute 94 percent of the agencies' costs; the remainder is for travel and per diem expenses. The salary and benefit costs result from the efforts of agency staff to prepare the first U.S. self-assessment report, review all other countries' reports as part of the peer review process, and participate in all aspects of the first review meeting. (See app. II for a breakdown of expenditures by each agency.)

Full Costs of IAEA Support Are Not Known

In late 1993, a working group that participated in the drafting of the Convention estimated that IAEA's costs could range from \$10,800 to \$10.3 million for the first review meeting. NRC officials told us that they believe that IAEA's actual costs will be significantly less—about \$1 million to administer the first review meeting. The factors affecting IAEA's costs primarily involve the number of languages used to conduct the meeting of the parties and the corresponding translation and interpretation services.⁶ IAEA's costs to administer future review meetings have not been estimated.

The Convention states that IAEA will bear the cost of administering the meeting of the parties. IAEA's cost of holding the meeting in Vienna is expected to be funded from IAEA's operating budget, which the United States supports through an annual 25-percent contribution. IAEA's 1997 and 1998 budget shows that IAEA plans to dedicate about \$330,000 in 1997 and 1998 for Convention-related activities. According to an NRC official, IAEA, whose regular budget has been subject to a policy of "zero real growth" since 1985, may have difficulty financing the initial review meeting. As a result, this official said that additional financial assessments of participating countries may be warranted to provide the necessary funds for IAEA to administer the Convention. The need for additional financial assessments will have to be addressed during the April 1997 preparatory meeting. NRC officials told us they were concerned about IAEA's potential costs to administer the Convention and that the United States will seek to keep these costs to a minimum.

The Convention also permits participating countries to request, after receiving consensus approval from the other countries, additional support and administrative services from IAEA. IAEA's Deputy Director General for Nuclear Safety told us that it is likely that IAEA will receive requests for such assistance and would cover these costs from its regular budget.

NRC and DOE officials told us that they believe the Convention will not stimulate any significant requests for additional assistance to upgrade unsafe reactors. An NRC official told us that as a result of the meetings, there may be some reordering of assistance priorities, but he noted that requirements have already been identified over the past several years through regular multilateral and bilateral assistance channels. A DOE official noted that by the time the first meeting of the parties occurs in 1999, some Western assistance efforts should be winding down, and many safety upgrades will have already been made.⁷

IAEA's Deputy Director General for Nuclear Safety told us, however, that the Convention may uncover additional safety problems that require attention. As a result, the countries with the most acute safety problems may seek to use the Convention process as leverage to obtain additional nuclear safety assistance.

AGENCY COMMENTS

We provided copies of a draft of this report to NRC for its review and comment. NRC obtained and consolidated additional comments from the departments of State and Energy. On December 23, 1996, we met with NRC officials, including the Director, Office of International Programs, and State's Director, Nuclear Energy Affairs, to discuss their comments. In general, these officials agreed with the facts and analysis presented. They gave us additional clarifying information, and we revised the text as appropriate. The officials noted that the Convention is fairly well developed because of the significant amount of work already done by various countries' representatives during several preliminary meetings. In their opinion, it is very important that the United States ratify the Convention before the April 1997 preparatory meeting in order to (1) shape the peer review process to create the most rigorous and systematic analysis of the self-assessment reports, (2) keep the implementation costs as low as possible, and (3) use the United States' diplomatic and political strength to make the Convention an integral component of a network of binding international legal instruments that enhance global safety.

We also provided IAEA with a copy of the draft report. In its comments, IAEA, including the Deputy Director General for Nuclear Safety, suggested some technical revisions to the text, which we incorporated as appropriate. IAEA noted that the

⁶The lowest range of estimates, based on English as the primary language, was considered artificial, since a number of incidental expenses were not included. The high end of the estimates is based on the use of six languages—Arabic, Chinese, English, French, Russian, and Spanish.

⁷For more information on assistance efforts, see our reports entitled *Nuclear Safety: Status of U.S. Assistance to Improve the Safety of Soviet-Designed Reactors* (GAO/RCED-97-5) and *Nuclear Safety: International Assistance Efforts to Make Soviet-Designed Reactors Safer* (GAO/RCED-94-234).

April 1997 preparatory meeting will provide countries with the opportunity to decide on the review process and factors that will determine the costs to implement the Convention. IAEA also views the Convention as a major accomplishment that will assist in achieving and maintaining a high level of safety worldwide. In its view, the Convention will provide for a degree of openness about national safety programs that has not existed in the past.

SCOPE AND METHODOLOGY

To obtain information on how the Convention will be reviewed for compliance, we examined relevant parts of the Convention and interviewed agency officials from the Department of State, DOE, and NRC and other officials knowledgeable about international agreements from the Congressional Research Service, Georgetown University Law Center, and New York University. We also discussed the Convention with officials from IAEA, including the Director General, the Deputy Director General for Nuclear Safety, and the Senior Legal Officer. These matters were also discussed with officials from the U.S. Mission to the United Nations System Organizations, Vienna, Austria, and the Nuclear Energy Institute, Washington, D.C. We also reviewed relevant documentation provided by these agencies and officials.

To identify cost information, we obtained cost data from the Department of State, DOE, and NRC. We also obtained data developed by IAEA's Division of Nuclear Safety. We did not independently verify the accuracy of these data.

We performed our review from October 1996 through December 1996 in accordance with generally accepted government auditing standards.

Copies of this report are being sent to the Secretaries of State and Energy, the Chairman of NRC, the Director of the Office of Management and Budget, and other interested parties. We will also make copies available to others on request.

ALLEN LI,

Associate Director, Energy, Resources, and Science Issues.

APPENDIX I

COUNTRIES THAT HAD SIGNED OR SIGNED AND RATIFIED THE CONVENTION ON NUCLEAR SAFETY AS OF DECEMBER 1996

Country	Signed convention	Ratified convention	Number of operating civil nuclear power reactors ¹
Algeria	X		0
Argentina	X		2
Armenia	X		1
Australia	X		0
Austria	X		0
Bangladesh	X	X	0
Belgium	X		7
Brazil	X		1
Bulgaria	X	X	6
Canada	X	X	21
Chile	X		0
China	X	X	3
Croatia	X	X	0
Cuba	X		0
Czech Republic	X	X	4
Denmark	X		0
Egypt	X		0
Finland	X	X	4
France	X	X	56
Germany	X		20
Ghana	X		0
Greece	X		0
Hungary	X	X	4
Iceland	X		0
India	X		10
Indonesia	X		0
Ireland	X	X	0
Israel	X		0
Italy	X		0

COUNTRIES THAT HAD SIGNED OR SIGNED AND RATIFIED THE CONVENTION ON NUCLEAR SAFETY
AS OF DECEMBER 1996—Continued

Country	Signed convention	Ratified convention	Number of operating civil nuclear power reactors ¹
Japan	X	X	51
Jordan	X		0
Kazakhstan ²	X		1
Republic of Korea	X	X	11
Latvia		X	0
Lebanon	X	X	0
Lithuania	X	X	2
Luxembourg	X		0
Mali	X	X	0
Mexico	X	X	2
Monaco	X		0
Morocco	X		0
Netherlands	X	X	2
Nicaragua	X		0
Nigeria	X		0
Norway	X	X	0
Pakistan	X		1
Peru	X		0
Philippines	X		0
Poland	X	X	0
Portugal	X		0
Romania	X	X	0
Russia	X	X	29
Slovak Republic	X	X	4
Slovenia	X	X	1
South Africa	X		2
Spain	X	X	9
Sudan	X		0
Sweden	X	X	12
Switzerland	X	X	5
Syria	X		0
Tunisia	X		0
Turkey	X	X	0
Ukraine	X		16
United Kingdom	X	X	35
United States	X		109
Uruguay	X		0
Total	65	29	431

¹ Number of operating reactors as of December 31, 1995.

² The installation is a sodium-cooled fast breeder reactor.

Sources: Nuclear Regulatory Commission and International Atomic Energy Agency.

APPENDIX II

THE NUCLEAR REGULATORY COMMISSION'S, DEPARTMENT OF STATE'S, AND DEPARTMENT
OF ENERGY'S ESTIMATED COSTS TO IMPLEMENT THE CONVENTION

This appendix provides information on the costs that have been or may be incurred by the Nuclear Regulatory Commission (NRC), the Department of State, and the Department of Energy (DOE) in implementing the Convention on behalf of the United States. NRC, State, and DOE estimated together they could spend about \$1.1 million in travel and salary and benefit costs to prepare for and participate in the first review meeting, which is scheduled to take place no later than April 1999. This amount—based on the number of NRC staff needed to prepare for and attend meetings—represents a higher-range estimate of a figure that could be as low as about \$700,000.

TABLE 2.—NRC's, STATE's, AND DOE's ESTIMATED COSTS TO IMPLEMENT THE CONVENTION

Element of cost	NRC	State	DOE	Total
Travel	\$45,000	\$12,000	\$8,000	\$65,000
Salary/benefits	¹ 909,000	30,000	116,000	1,055,000
Total	954,000	42,000	124,000	1,120,000

Note: Actual costs incurred to date by these agencies total \$99,500 for fiscal years 1995 and 1996.

¹ NRC's reported costs range from \$450,000 to \$909,000.

Sources: NRC, Department of State, and DOE.

