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Report to Sen. John Glenn, Chairman, Senate Committee on Governmental Affairs: Energy, Nuclear Proliferation and Federal Services Subcommittee; by Elmer B. Staats, Comptroller General.

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The various alternative methods that the Government might use to generate revenues for U.S. financial participation in the activities of the International Atomic Energy Agency, especially the safeguards program, would either encounter legal difficulties or be impractical. The alternative sources of revenue considered included surcharges on uranium enrichment services, nuclear equipment and material, and operations of U.S. nuclear power reactors. Findings/Conclusions: Although a few of the alternatives offer some potential, each has disadvantages. Any change from the present method of funding might set a precedent and create pressure for the funding of other international organizations through separate revenue-raising schemes. The current system provides for congressional oversight, and no additional effort is required to collect the funds. Under the current method, U.S. support to the Agency is paid for by the general public. Applying a surcharge to the price of enrichment services would be the most feasible alternative. The Agency cannot adequately project its future funding needs, and may not have the ability to effectively absorb any future substantial increases in safeguards-related assistance. Recommendations: GAO is not recommending that the current method of funding U.S. support of the agency from

general revenues be changed. (Author/SC)

REPORT OF THE COMPTROLLER GENERAL OF THE UNITED STATES

Alternative Methods For Funding U.S. Support Of International Atomic Energy Agency Activities

Department of State and Other Federal Agencies

GAO is not recommending that the current method of funding U.S. support of the International Atomic Energy Agency from general revenues be changed. Most alternative methods would encounter legal difficulties or would be impractical. A few offer some potential but each also has disadvantages that must be considered.

ID-77-20

MAY 5, 1977

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-181963

The Honorable John Glenn
Chairman, Subcommittee on Energy,
Nuclear Proliferation and
Federal Services
Committee on Governmental Affairs
United States Senate

Dear Mr. Chairman:

In response to your request of October 22, 1976, we have studied the feasibility of various alternative methods the Government might use to generate revenues for U.S. financial participation in International Atomic Energy Agency activities, especially the safeguards program. We also developed information on the Agency's budget process, ability to project future funding requirements, and plans for using funds already provided by the United States to strengthen Agency safeguards.

As you requested, we did not obtain formal written comments on the report from involved agencies, but did discuss it with officials of the Department of State and the Energy Research and Development Administration, and incorporated their comments where appropriate.

Sincerely yours,

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE SUBCOMMITTEE
ON ENERGY, NUCLEAR PROLIFERATION
AND FEDERAL SERVICES, SENATE
COMMITTEE ON GOVERNMENTAL AFFAIRS

ALTERNATIVE METHODS FOR FUNDING U.S. SUPPORT OF INTERNATIONAL ATOMIC ENERGY AGENCY ACTIVITIES

Department of State and
other Federal Agencies

D I G E S T

At the request of the Ad Hoc Chairman for Nuclear Affairs of the Senate Committee on Government Operations, GAO studied the feasibility of funding U.S. support to the International Atomic Energy Agency from various sources as alternatives to funding this support from general revenues.

The alternative sources of revenue considered included surcharges on

--uranium enrichment services;

--nuclear equipment and material; and

--operations of U.S. nuclear power reactors.

GAO is not recommending that the present system of funding be changed. Most alternatives would encounter legal problems or would be impractical. A few offer some potential, but each has disadvantages. Any change from the present method might set a precedent and create pressure for the funding of other international organizations through separate revenue raising schemes. (See p. 37.)

An important factor when considering alternatives to funding from general revenues is the degree of congressional control retained. Another is the time and effort expended to administer the collection and distribution of funds under the alternatives in relationship to the desired amount of support. The current system provides for congressional oversight and no additional effort is needed to collect the funds. (See p. 17.)

Under this current method U.S. support to the Agency is paid for by the general public. The merits of alternatives arise if a determination is made that the general public does not benefit from U.S. support to the Agency and that the nuclear industry and its customers should pay for such support. (See p. 17.)

Applying a surcharge to the price of enrichment services would be the most feasible alternative. Assuming that such a surcharge were passed on to consumers, the annual cost for each household using nuclear-generated electricity would be about 16 cents. However, foreign customers would probably view it as inequitable because they would be partially funding U.S. contributions to the Agency in addition to providing their own direct financial support to the Agency. (See p. 37.)

GAO's study also shows that

--The Agency cannot adequately project their future funding needs. (See pp. 8-10.)

--The Agency may not have the ability to effectively absorb any future substantial increases in safeguards-related assistance. (See pp. 14-16.)

The International Atomic Energy Agency is an autonomous organization of the United Nations. It is responsible for international activities concerned with the peaceful uses of atomic energy. The Agency's objectives are to accelerate and enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world.

The Agency, located in Vienna, Austria, also administers international safeguards designed to detect the diversion of nuclear material to non-peaceful purposes. It receives its financial support from annual assessments of member nations, based on the U.N. scale of assessment, and from voluntary contributions.

Contents

ABBREVIATIONS

ACDA	Arms Control and Disarmament Agency
AID	Agency for International Development
ERDA	Energy Research and Development Administration
EURATOM	European Atomic Energy Community
GAO	General Accounting Office
IAEA	International Atomic Energy Agency
NRC	Nuclear Regulatory Commission

CHAPTER 1

INTRODUCTION

On October 22, 1976, the Ad Hoc Chairman for Nuclear Affairs of the Senate Committee on Government Operations (now the Senate Committee on Governmental Affairs) requested that we review alternative methods of financing the activities of the International Atomic Energy Agency (IAEA). Specific information was requested on IAEA's budget process, the data it uses to project future safeguards funding requirements, and the feasibility of the U.S. Government generating revenues to pay the cost of its support of IAEA from such methods as surcharges on nuclear equipment or fuel rather than funding such costs from general revenues.

IAEA, founded in 1957, is an autonomous intergovernmental organization headquartered in Vienna, Austria, with 109 member nations. Under the aegis of the United Nations, it is recognized as the agency responsible for international activities concerned with the peaceful uses of atomic energy.

The Agency's objectives, as defined in its Statute, are that it:

> "shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, as far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose."

IAEA's functions include establishing and administering international safeguards, exchanging scientific and technical information on peaceful uses of atomic energy; providing assistance to developing countries; and encouraging and assisting research, development, and application of atomic energy through programs in food, agriculture, and physical and life sciences. It also has a program for nuclear safety and environmental protection. These programs and activities involve not only member nations but also cooperation with many international, regional, and national organizations. (See app. II for organizational chart of IAEA.)

The IAEA safeguards program establishes a system of inspection and verification which, when applied to one country's nuclear activities, will provide assurance to other countries that nuclear material is not being diverted for non-peaceful purposes. The principle behind such safeguards is that the risk of early detection and unmasking in the world community will deter diversions. IAEA safeguards are designed only to detect diversions of nuclear material by a nation to non-peaceful purposes. The IAEA recommends procedures that member nations should use to protect such material from terrorist or subnational groups, but implementation is up to the member nations.

IAEA's safeguards efforts are of major interest to the United States, which relies on IAEA to insure that nuclear materials provided to other nations for peaceful uses are not used for any military purposes and are not transferred to unauthorized persons.

Congressional concern over safeguards was evidenced by extensive hearings during the 94th Congress. As a result the 1976 and 1977 appropriation legislation for International Organizations and Programs required that not less than $1 million of each year's appropriated funds be used to strengthen the IAEA safeguards program. President Ford, in an October 28, 1976, Nuclear Policy Statement, also emphasized safeguards and directed the Secretary of State and the Administrator of the Energy Research and Development Administration (ERDA) to undertake a major effort to upgrade IAEA's technical safeguards capabilities.

The United States protects and fosters its interest in IAEA through a small diplomatic Mission, headed by a U.S. Representative with the rank of Ambassador. The Mission recommends U.S. policy positions, represents the United States at most IAEA/Vienna meetings, informs U.S. Government agencies of developments within and concerning IAEA, and maintains liaison with representatives of other IAEA member nations.

To carry out its programs, the IAEA assessed its member nations a total of $34.2 million in 1976, including $9.5 million from the United States. In addition, the United States provided $5.7 million in voluntary support to the Agency. Although these amounts are relatively small when compared with total U.S. support for international organizations, new technology and the construction of new nuclear facilities could require substantial increases in the funding that IAEA will need to adequately perform its safeguards role.

SCOPE OF REVIEW

Work on this review was performed in Vienna, Austria, at IAEA headquarters and in Washington, D.C., at the Energy Research and Development Administration; Nuclear Regulatory Commission; Departments of State, Commerce, and the Treasury; Arms Control and Disarmament Agency; Export-Import Bank of the United States; and Agency for International Development.

In analyzing various alternative methods for funding U.S. support to IAEA, we did not attempt to determine the cost of establishing or administering each alternative or the impact any alternative would have on the U.S. nonproliferation policy. Our review concentrated on the general implications of changing the current method of funding, the legal and procedural limitations on each alternative, the ability of each method to generate sufficient funds, and the potential impact of each alternative on the nuclear industry and its foreign and domestic customers. For our study we arbitrarily set $10 million as a target amount to be generated under each alternative. This amount was approximately equivalent to the total U.S. support to IAEA in 1975.

We did not obtain formal agency comments on this report, but officials of the Department of State and the Energy Research and Development Administration provided informal comments, which are incorporated as appropriate throughout the report.

CHAPTER 2

IAEA'S BUDGET PROCESS AND FUTURE REQUIREMENTS

IAEA receives revenues from annual assessments and voluntary contributions of its member nations, miscellaneous resources such as publication sales and allocations received from various U.N. organizations. Estimated revenues in 1977 will amount to about $57.3 million, including $43.5 million in assessments and miscellaneous revenues, $7.5 million in voluntary contributions for technical assistance and partial support of IAEA research laboratories, and $6.3 million in contributions from the United Nations and others for support of specific IAEA projects.

The assessments and miscellaneous revenues, channeled through IAEA's Regular Budget, are used to support the regular activities of the Agency, including its safeguards program. Voluntary contributions, channeled through IAEA's Operational Budget, are used to support two IAEA laboratories and technical assistance and training at levels above those provided for in the Regular Budget. Allocations from U.N. organizations for support of specific projects are handled in IAEA accounts as Extrabudgetary Resources. Table 1 shows the programs funded from these three sources.

IAEA also receives in-kind contributions, such as equipment, training, fellowships, and research, from a number of its members.

REGULAR BUDGET

Miscellaneous revenues--sales of publications, surplus equipment, and incidental services and transfer of a cash surplus--will provide 15 percent ($6.5 million) of the estimated 1977 Regular Budget. The remaining 85 percent of the funds ($37 million) will come from member assessments, which are based on a scale fixed annually by the IAEA membership.

Assessments for individual IAEA members in 1977 will range from $10.3 million (27.9 percent) for the United States, to the minimum of $6,567 (0.02 percent) for 31 other nations. (See app. III.) The percentage paid by each member is made up of two components--a safeguards and a non-safeguards portion.

Table 1
IAEA'S 1977 Budget Estimate

Program	Regular Budget	Operational Budget	Extrabudgetary Resources: United Nations organizations	Extrabudgetary Resources: Special contributions	Total estimated resources
		(in thousands)			
Policy-making organs	$ 1,614				$ 1,614
Executive management and technical programme planning	915				915
Technical assistance and training	1,867	$6,350	$4,200	$ 510	12,927
Food and agriculture	2,512		680	365	3,557
Life sciences	1,944		140	34	2,118
Physical sciences	3,613				3,613
International Center for Theoretical Physics	600	1,045			1,645
Nuclear power and reactors	2,988		8	30	3,026
Nuclear safety and environmental protection	3,326		245		3,571
International Laboratory of Marine Radioactivity	610	110	90		810
Information and technical services	2,905				2,905
Nuclear explosions for peaceful purposes	260				260
Safeguards	7,951				7,951
Administration	4,709				4,709
General services	4,177				4,177
Service activities	160				160
Permanent Headquarters a/	3,350	———	———	———	3,350
TOTAL	$43,501	$7,505	$5,363	$939	$57,308

a/ A temporary fund established to pay for IAEA's move to permanent headquarters.

SOURCE: The Agency's Programme for 1977-82, IAEA Document GC (XX)/567.

--The non-safeguards component is computed on the U.N. scale of assessment, adjusted for differences in total membership between the United Nations and IAEA.

--The safeguards assessment is also derived from the U.N. scale of assessment but includes further adjustments to insulate developing member nations of IAEA from the effects of rapid increases in the costs of implementing safeguards.

The current formula for determining the safeguards assessment was adopted in September 1976, when the IAEA membership adopted a U.S. proposal to freeze the safeguards contributions of developing members. As a result of this freeze, developing countries are assessed for safeguards at rates which are somewhat below their base rates of assessment for the non-safeguards portion. The safeguards assessment formula is scheduled for review in 1980, but U.S. Mission officials said the subject could be reviewed earlier if necessary.

Both IAEA and U.S. Mission officials advised us that IAEA's assessment methods are considered adequate to finance current levels of activity. Changes are proposed occasionally, but none are under serious consideration at this time. A major change could require amending the IAEA Statute--a lengthy process, according to U.S. Mission officials.

IAEA officials were unwilling to speculate on the prospects of a gap existing between revenues needed for the safeguards mission and revenues the membership would agree to pay in assessments. IAEA officials indicated that assessments for safeguards were based on the decision of the membership and reflected the anticipated level of facilities requiring safeguards under existing and anticipated safeguards arrangements. They added that they did not foresee a situation in which there would be a shortfall of necessary funding. Nevertheless, Agency safeguards funding in its Regular Budget has been augmented by substantial voluntary contributions to support safeguards-related activities.

We were told that IAEA has the lowest assessment delinquency rate--under 1 percent--of any organization in the U.N. family. An IAEA official said he was not aware of any member nation withholding its assessment because it objects to IAEA policies.

OPERATIONAL BUDGET

The Operational Budget provides partial support to two laboratories operated by IAEA--the International Centre for Theoretical Physics and the International Laboratory of Marine Radioactivity--and to a variety of technical assistance projects.

Voluntary contributions are the principal source of income for the Operational Budget, and IAEA annually sets a target for contributions to fund this portion of the budget. The U.S. Mission and IAEA believe that as long as contribution targets for technical assistance are not too high, the members will voluntarily contribute the targeted funding level.

Technical assistance projects are proposed by the developing member states, and IAEA reviews them to determine their feasibility, both technically and in the context of available limited resources. In selecting projects, an effort is made to insure an adequate distribution of benefits among the developing member states.

BALANCING FUNDING OF TECHNICAL ASSISTANCE AND SAFEGUARDS

The IAEA Statute does not require that the targeted amount for the technical assistance program be proportional to the level established for safeguards. However, several officials commented that the funding of IAEA's technical assistance has tended to increase as safeguards funding has increased. Some developing countries have even suggested the spending for these two programs should be equal.

The U.S. Mission to IAEA advised us that it would not want development of the safeguards program to be constrained by the availability of funds for technical assistance since it expects a need for the safeguards budget to grow faster than technical assistance. However, U.S. officials recognize the need for maintaining a balance between support for safeguards activities and technical assistance activities which are of primary interest to the developing countries.

IAEA commented that establishing a separate budget for safeguards would be highly undesirable. The concept that its regulatory and technical assistance functions are complementary is contained in the IAEA Statute and IAEA doubts that a purely safeguards organization would be politically feasible and internationally acceptable today.

PROJECTING FUTURE SAFEGUARDS REQUIREMENTS

We attempted to obtain data from IAEA on projected revenue requirements for safeguards activities in order to estimate future U.S. costs of IAEA safeguards. Although IAEA has developed safeguards budget estimates for 1977 ($7.9 million) and 1978 ($9.1 million), only a general description of the program for the 6-year period 1977-1982 has been prepared. (See app. IV.) Pertinent factors affecting this program include:

--Nuclear material subject to IAEA safeguards is expected to double by 1982.

--The number of inspectors is expected to increase slower than the amount of nuclear material to be safeguarded if the trend to larger facilities continues and as the Agency becomes more effective at safeguarding nuclear material.

--Regional inspection offices may be established.

--Many nuclear power plant projects have been delayed, thereby reducing previous estimates for safeguards requirements.

The U.S. Mission noted that political sensitivities and the uncertainty of future safeguards requirements generally discourage IAEA from making long-range safeguards budget projections. A senior IAEA safeguards official cautioned that there are so many important but unpredictable variables that one cannot place much confidence in long-range estimates. The U.S. is, however, assisting IAEA to develop capabilities for predicting future safeguards costs.

IAEA did estimate that safeguards funding requirements by 1985 could total between $20 million and $30 million. Based on that estimate, the U.S.-assessed share of the safeguards budget would range from $6 million to $9 million, assuming the current 29 percent rate of assessment for safeguards. The IAEA estimate assumed that the past relationship between increases in nuclear power and safeguards costs would continue and applied this factor to the nuclear power capacity expected to exist in 1985.

According to IAEA's Inspector General, it is difficult to forecast when nuclear facilities will be completed and subjected to safeguards. There is often a gap of

several years between the planned operational date of a nuclear plant and the time the plant actually begins to operate. For example, the forecast based on announcements collected by IAEA in 1971 predicted 79 nuclear power plants in non-nuclear weapons states by 1975; the actual number proved to be 61. The difference apparently was mainly due to delays, as only a small number of projects had actually been abandoned.

The safeguards agreement between the IAEA and the European Atomic Energy Community (EURATOM) 1/ illustrates the uncertainty in forecasting the date that IAEA safeguards agreements will be implemented. The EURATOM agreement was signed in 1973 and was expected to be implemented in 1974. It was not until February 1977 that this agreement entered into force because of procedural difficulties encountered by some EURATOM members in ratifying the Treaty on the Non-Proliferation of Nuclear Weapons and internal differences in the Community as to the role of IAEA and EURATOM inspectors. Also, it is still not certain when United States and United Kingdom offers to subject their nuclear facilities not associated with national security to IAEA safeguards will be implemented.

Rate of growth of nuclear facilities subject to inspection is an important variable, but the form of future nuclear activity will also affect IAEA safeguards. For example:

--IAEA believes that safeguarding of spent fuel reprocessing plants will significantly increase its workload because continuous verification of nuclear material flow is needed. One IAEA official estimated that about 1,000 man-days per year would be required to safeguard one reprocessing plant.

--The concept of multinational/regional nuclear fuel cycle centers being studied by IAEA would place nuclear facilities together to serve a group of nations or regions. This would minimize the number of sensitive reprocessing facilities and concentrate the safeguards workload.

--Breeder reactors may be added to the IAEA workload. The Agency is studying the safeguards implications of such reactors.

1/ EURATOM is composed of Belgium, Denmark, France, West Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom.

--Changes in safeguards effectiveness standards could also affect the safeguards budget. According to the IAEA Inspector General, the level of effectiveness to be achieved is a key factor in determining the level of safeguards effort needed. The task is to apply safeguards with a high degree of reliability and assurance within acceptable cost limits and without unduly interfering with commercial operations. IAEA is now preparing its first report on the effectiveness of safeguards inspections.

--The development of new technologies, such as the laser isotope separation method to enrich uranium, may add to IAEA's safeguards workload. Because information on such technology is classified, the IAEA Inspector General felt that he could only speculate about the impact of laser isotope enrichment technology. He was concerned, however, that it would increase the importance of monitoring natural uranium.

CONCLUSIONS

There are no reliable projections on how much IAEA safeguards or other programs will cost beyond 1978, because the quantity of material and type of facilities to be safeguarded and the intensity of the safeguards to be applied are not known. IAEA has estimated that by 1985 safeguards may cost between $20 million and $30 million. On that basis, future U.S. assessments for safeguards might range from $6 million to $9 million by 1985.

IAEA officials were unwilling to speculate on the prospects that future safeguards funding requirements would outstrip the assessments for safeguards. Nevertheless, the United States and other countries make substantial voluntary contributions to support safeguards-related activities.

Coupled with the funding requirements for safeguards activities there is considerable concern within the Agency membership that if safeguards funding is increased then there might be pressure to also increase technical assistance to the developing countries. These factors hinder the ability to project what future costs must be borne by the United States and other members to adequately fund IAEA, especially an effective, international safeguards program.

CHAPTER 3

U.S. ASSISTANCE TO IAEA

Total U.S. assistance to IAEA for 1976 and 1977 is about $33 million including $9.8 million for safeguards. Assistance to IAEA is provided by the Department of State, Agency for International Development (AID), Arms Control and Disarmament Agency (ACDA), Energy Research and Development Administration, and Nuclear Regulatory Commission (NRC).

Table 2 shows the sources of U.S. support to IAEA since 1975.

Table 2

Agency appropriation	Form of assistance	1975 (actual)	1976 (actual)	1977 (estimate)	1978 (request)
			(000 omitted)		
State	Cash	$ 7,452	$ 9,546	$10,319	$11,684
AID	Cash	1,106	1,516	1,651	1,780
	In-kind	1,394	2,984	4,349	a 11,220
ACDA (note b)	In-kind	310	650	585	200
ERDA (note b)	In-kind	c 300	c 579	729	715
NRC (note b)	In-kind	--0--	15	25	25
Total		$10,562	$15,290	$17,658	$25,624

a/ Includes $3 million supplemental request for fiscal year 1977.

b/ Fiscal year basis (transitional quarter included in 1976).

c/ Estimated.

ASSISTANCE FUNDED BY STATE

The Department of State funds the U.S.-assessed share of IAEA's Regular Budget from its appropriation for "Contributions to International Organizations." This appropriation is also used to fund the U.S.-assessed share of all other U.N. organizations. The United States was assessed approximately 28 percent of the total IAEA Regular Budget assessment in 1976. The safeguards and non-safeguards components of IAEA's Regular Budget which have been or are expected to be assessed of the United States are shown below.

Assessment		1976 (actual)	1977 (actual)	1978 (estimate)
		(000 omitted)		
Safeguards		$ 1,999	$ 2,323	$ 2,630
Non-safeguards		7,546	7,996	9,054
Total	a	$ 9,546	$10,319	$11,684

a/ Does not add due to rounding.

ASSISTANCE FUNDED BY AID

From appropriations for "International Organizations and Programs," AID provides voluntary cash contributions to IAEA for technical assistance plus various forms of in-kind assistance. However, AID does not provide the in-kind support directly to IAEA but allocates the funds to ERDA, which in turn obtains and provides the equipment, experts, and other support to IAEA.

As of early February 1977, ERDA officials were planning to use funds obtained from AID's 1976 and 1977 appropriations to provide the following assistance to IAEA.

	1976	1977	Total
	(000 omitted)		
Safeguards and physical security-related activities	$1,300	$1,600	$2,900
Non-safeguards related activities	1,684	2,749	4,433
Total	$2,984	$4,349	$7,333

The amounts shown for safeguards and physical security include $1 million designated in the appropriation for safeguards only. As of early April 1977, ERDA informed us that it had obligated $2.0 million of the $2.9 million for safeguards and physical security-related activities for 1976 and 1977 as follows.

	(000 omitted)
Brookhaven National Laboratory	
International Safeguards Project Office	$ 250
Advance funding for IAEA computer and equipment	557
Technical Support Organization	253
Cost-free experts and other direct costs	500
Battelle Northwest Laboratory	100
Los Alamos Scientific Laboratory	408
Sandia Laboratories	257
Nuclear Division of Union Carbide	85
Argonne National Laboratory	145
Idaho Nuclear Engineering Laboratory	45
	$2,600

An International Safeguards Project Office has been established at Brookhaven National Laboratory to assist in developing and implementing this program. Planning and implementation are being accomplished through an Interagency Policy Steering Committee and a Technical Support Coordinating Committee. These Committees have representatives from State, ACDA, and NRC. Examples of the types of tasks that will be funded under the program are included in appendix V.

The non-safeguards related assistance includes fellowships, equipment, experts, training, and funding of a regional fuel cycle center study. This assistance is provided to IAEA and to IAEA members.

In his October 28, 1976, policy statement, President Ford directed the Secretary of State and the Administrator of ERDA to work with other nations in a major effort to upgrade IAEA's safeguards functions and capabilities. In line with this, President Ford's Budget Submission for 1978 included a substantial increase in the AID funds being requested for support of IAEA. The 1978 budget proposed a supplemental safeguards appropriation of $3 million for 1977 and a total $10 million funding level for 1978.

The $3 million supplemental request for 1977 would be used for (1) system studies and field exercises in safeguards activities at such facilities as isotope separation plants and chemical reprocessing plants, (2) improvement of IAEA containment and surveillance techniques, and (3) development of better methods for the nondestructive assay of nuclear material. As of early February 1977, the specific projects to be funded had not yet been developed.

The $10 million funding level requested by AID for support of IAEA for 1978 is tentatively projected to be used as follows: (1) $1,780,000 in the form of a voluntary cash grant to IAEA for technical assistance, (2) $5,600,000 as in-kind assistance for safeguards, and (3) $2,620,000 for purposes other than safeguards.

Research to upgrade IAEA's safeguards capabilities is closely related to domestic U.S. safeguards research. Similarly, equipment to be developed for IAEA might well be developed under the U.S. domestic program if funds were not available for in-kind assistance to IAEA.

ASSISTANCE FUNDED BY ACDA, ERDA, AND NRC

The assistance provided by ACDA, ERDA, and NRC is used for research studies, conferences and symposia, safeguards procedures and techniques, improved surveillance and containment devices, and new safeguards verification instruments. Most of the ERDA and ACDA funds are used for safeguards-related research. NRC assistance goes toward general staff support provided to IAEA.

IAEA'S ABILITY TO ABSORB INCREASED U.S. ASSISTANCE

At IAEA and the U.S. Mission, we asked if the IAEA could effectively absorb additional safeguards-related assistance. The Mission officials believe that IAEA could effectively absorb the 1976 and 1977 level of U.S. assistance for safeguards, but that, if substantially more assistance were provided, IAEA would need additional personnel to effectively absorb it.

IAEA generally agreed with the U.S. Mission view. An official stated that managing the extra assistance for safeguards represents work beyond the budgeted level of effort. For example, considerable time and effort was recently devoted to formalizing 96 task statements identifying areas where such U.S. assistance could be used. He

said that if all 96 tasks were approved for immediate implementation, IAEA's Safeguards Department would not have the qualified manpower to effectively manage its portion of the effort.

Although there are no plans to immediately implement all 96 tasks, the official's comments reflect the view that absorbing the U.S. assistance already provided would impact on IAEA's longer term ability to effectively use any further increased level of U.S. assistance. ERDA officials commented that they plan to provide cost-free U.S. experts on a long-term basis to help IAEA manage its portion of the current effort.

One IAEA official discussed the need to effectively plan and manage the voluntary safeguards assistance and not to rush to spend the funds just because they were available. To illustrate his position, he pointed out that IAEA is developing television videotape surveillance systems, costing about $12,000 each, for use in nuclear facilities. Although a lot of money could be spent quickly buying these surveillance systems, he felt it would not be prudent without further testing and improving the system and without knowing whether nuclear plant operators would permit installation of the equipment.

In this respect, for each facility to be inspected, IAEA negotiates a confidential facility agreement, setting forth the ground rules as to what IAEA inspectors may do and what equipment can be installed or used in conjunction with inspection activities. The use of such equipment as the videotape surveillance system must be permitted under the agreement concerning the specific facility. ERDA officials advised us that provisions for film camera surveillance have generally been accepted, and that IAEA can seek to change the provisions of facility agreements as deemed necessary.

Several IAEA officials said that more money was not necessarily the most important safeguards need. Several other priority concerns mentioned include the need for

--completion of safeguards agreements for nuclear facilities and fissionable material,

--access to nuclear facilities for developing and demonstrating safeguards techniques and equipment and training inspectors, and

--the time and talents of uniquely skilled experts which, in some cases, are only available in a few developed countries.

ERDA officials indicated that they agreed and are working to respond to some of these other priority needs. Planned U.S. assistance includes increased access to U.S. facilities for the IAEA staff for training and demonstration purposes.

CONCLUSIONS

The United States now provides substantial in-kind assistance to IAEA beyond what the Agency recognizes as its current requirements for regular operations. The IAEA, moreover, may not have the ability to effectively absorb further substantial increases in U.S. monetary and in-kind assistance.

Currently, U.S. funds designated for use in upgrading IAEA safeguards above the funds assessed in the Agency's Regular Budget are not being used directly to carry out actual safeguards inspections or to employ more inspectors. Such funds are used for research to improve both domestic and international safeguards or to provide U.S. training and experts to IAEA.

CHAPTER 4

FEASIBILITY OF SURCHARGES ON U.S. NUCLEAR POWER REACTOR OPERATIONS

In seeking alternative methods of funding U.S. support to IAEA, one must consider the advantages and disadvantages of the current method (U.S. support from general tax revenues) and those of each alternative. In chapters 4, 5, and 6 we strive to demonstrate these.

Underlying any funding method is the objective to be achieved. A determination of who benefits from the program will make the decision of who should pay for it easier.

Since the primary purpose of IAEA is to promote the peaceful uses of nuclear energy, one might conclude that only those in the nuclear industry or its customers should pay. Another approach might be that many IAEA programs are for the general welfare, particularly those related to medical research and safeguards. U.S. officials have indicated that for national security reasons the United States would want international safeguards, even if for some reason U.S. exports of nuclear material and equipment were halted.

A change from the current policy of funding IAEA from general revenues would require changes to existing legislation. Should a special tax or surcharge be adopted to fund U.S. support to IAEA, procedures to administer the collection of the revenues and to control the subsequent distribution of the funds generated would have to be developed.

The cost of administering the collection of revenues must be reasonable in relation to the amount of money expected to be collected. The less money involved, the less sophisticated the system to collect it should be. The collected funds should be subject to congressional control and the appropriation process.

The Congress, in the past, has indicated that it preferred U.S.-assessed contributions to international organizations to be combined into one appropriation account in order that it might focus on the total assessments being made of the United States. Additionally, such combining

requires the Department of State to assess the priority of the funding for different organizations whenever the Congress appropriates less funds than are requested for the international organizations.

Altering the funding of U.S. support to IAEA might set a precedent for similar funding of U.S. support to other international organizations. For example, it could create pressure to fund the World Health Organization by taxing medicines and pharmaceuticals or the Food and Agriculture Organization by placing a surcharge on food and agricultural items.

With these considerations in mind we reviewed the prospect for generating revenue to support IAEA through the use of a surcharge on the operations of domestic power reactors. We evaluated the feasibility of applying operating fees based on a flat charge per reactor, per megawatt capacity of the reactor, and per kilowatt hours of energy sold. Such alternatives could be used if certain legislative actions were taken.

The concept of levying annual operating fees on nuclear power facilities is not novel. The U.S. Government levied such fees on nuclear power reactors under authority of Title V of the Independent Offices Appropriation Act of 1952, (31 U.S.C. 483a) to recover the costs of the safety and environmental aspect of licensing and inspection. One such fee was established at $65 per thermal megawatt capacity of the reactor, with a minimum charge of $20,000. As a matter of Government policy, safeguards inspection costs were excluded from recovery because they were considered to benefit the total population and national security.

The collection of the annual fees ceased following March 1974 U.S. Supreme Court rulings that the standard to be applied in determining the legitimacy of a fee under the authority of the act was the "value to the recipient" of the service rendered by the agency. Since all members of a regulated industry may not receive special U.S. Government services during a year, the Court concluded that an annual fixed fee on all members of that industry designed to return an agency's cost was not valid. As so applied, the Court viewed the fixed fee as the levying of a "tax" and held that it was erroneous to so use the fee authority to "search for revenue."

Although the annual operating fees may be illegal under the authority of the Independent Offices Appropriation Act of 1952, the Congress could authorize such fees through new legislation.

In 1977, 69 nuclear power reactors are expected to be in commercial operation in the United States, and ERDA expects approximately another 150 to become operational by 1991. An annual charge of $20,000 for an operating license would currently generate almost $1.4 million and could reach $4.3 million in 1991. To generate $10 million, the charge would have to be about $154,000 per license in 1977.

The nuclear power reactors expected to be operational in 1977 and 1991 are projected to have capacities of almost 53,000 and 217,000 electrical megawatts, respectively. An annual operating surcharge of $65 per electrical megawatt would generate revenues of $3.4 million in 1977 and about $14 million in 1991. A fee of $204 per electrical megawatt would have to be charged in 1977 in order to generate $10 million. Table 3 shows the number and capacity of nuclear power reactors per State.

Table 3

Nuclear Power Reactors Expected to be Operational in 1977

State	Number of reactors	Electrical megawatt capacity
Alabama	4	4,354
Arkansas	1	880
California	5	3,852
Colorado	1	330
Connecticut	3	2,087
Florida	3	2,394
Georgia	1	849
Illinois	7	5,858
Iowa	1	597
Maine	1	860
Maryland	2	1,820
Massachusetts	2	867
Michigan	3	2,024
Minnesota	3	1,709
Nebraska	2	1,302
New Jersey	2	689
New York	6	4,154
North Carolina	2	1,760
Ohio	1	960
Oregon	1	1,178
Pennsylvania	3	3,123
South Carolina	5	4,361
Vermont	1	538
Virginia	4	3,672
Washington	1	860
Wisconsin	4	1,661
Total (26 States)	69	52,739

In 1976, approximately 201 billion kilowatt hours of power (about 10 percent of total U.S. production) were generated by nuclear power reactors. An estimated surcharge of .005 cents per kilowatt hour--approximately a 0.16 percent increase in the charge to residential users--would generate approximately $10 million a year.

CONCLUSIONS

The application of fees to domestic nuclear utilities, such as a flat charge per reactor, per megawatt of capacity, or per kilowatt hour of energy sold, could be used to generate revenues to support IAEA. The first two fees were once used by the U.S. Government to recoup some of the administrative costs of its nuclear regulatory functions. However, the Supreme Court ruled them invalid. Moreover, the surcharges required to generate the current level of U.S. funding to IAEA would have to be substantially greater than those that were applied in the past.

CHAPTER 5

FEASIBILITY OF SURCHARGES ON URANIUM ENRICHMENT SERVICES

In the United States, only ERDA currently enriches uranium for use as fuel in light water reactors. These reactors are used throughout the United States and in many foreign countries.

Our review showed that a surcharge on uranium enrichment services as an alternative method for generating revenues for U.S. support to IAEA appears to have potential. However, it would not affect the fueling of heavy water reactors that do not use enriched uranium. Moreover, because of legal restrictions, such a surcharge would have to be applied to both domestic and foreign purchasers of enrichment services.

ERDA's fee for enrichment services is based on the amount of separative work units required to separate uranium into a product containing the desired concentration or enrichment of the isotope U-235. Table 4 shows the amount of separative work units expected to be required to meet ERDA's commitment to enrich uranium for domestic and foreign customers.

Table 4

Fiscal year	Separative work units: Domestic sales	Foreign sales	Total sales
	millions		
1977	5.4	4.7	10.1
1978	7.1	5.6	12.7
1979	10.6	6.3	16.9
1980	12.2	7.7	19.9
1981	16.1	9.1	25.2
1982	16.4	9.5	25.9
1983	20.5	11.1	31.6
1984	19.1	10.9	30.0
1985	24.1	12.5	36.6
1986	21.5	12.5	34.0
Total	153.0	89.9	242.9

ERDA currently charges $61.30 or $69.75 per required separative work unit, depending on the type of contract under which the units are provided. Application of a $1 per unit surcharge to foreign and domestic sales would generate sufficient revenues to meet most, if not all, of the U.S. support of IAEA. Such a surcharge appears to be feasible, although changes to existing legislation would be necessary.

LEGISLATIVE AND INTERNATIONAL AGREEMENT PROBLEMS

There are several legal limitations on applying a surcharge to the sale of enrichment services. A constitutional restriction on applying taxes to exports appears to prohibit charging only foreign purchasers an additional fee to fund U.S. support to IAEA. Additionally, the Atomic Energy Act of 1954, as amended, (42 U.S.C. 2011) and some bilateral agreements for cooperation with other countries stipulate various conditions on the pricing of enrichment services.

Article I, Section 9, Clause 5, of the Federal Constitution provides that: "No Tax or Duty shall be laid on Articles exported from any State" to a foreign country. While terms such as "fee" or "surcharge" could be used in applying a charge to enrichment services, it appears such charges could be held to be "taxes" or "duties" and found to be unconstitutional if applied only to enrichment services provided foreign consumers.

The Atomic Energy Act provides that the prices for enrichment services be set to recover Government costs within a reasonable time, be no lower for foreign consumers than for U.S. consumers, and be non-discriminatory among U.S. consumers. To implement a surcharge on separative work unit sales, the provision stipulating that the price shall be based on cost would have to be revised.

In 1970, we reviewed a proposal to change this cost basis to one which would compare more closely to a commercial operation. We reported that the legislative history; the language of Section 161 (v) of the Atomic Energy Act of 1954, as amended; and statements from the 1966 hearings on Uranium Enrichment Services Criteria indicated that it was the intention of the Congress that

the separative work be sold at cost. 1/ In those circumstances, we concluded that any new criteria for pricing separative work should not be adopted without further action by the Congress. The Congress subsequently amended the legislation to make it more explicit that the basis of pricing would be cost.

In 1975, legislation was proposed to revise the basis for establishing uranium enrichment prices to enable ERDA to obtain the fair value for enrichment services and to eliminate or reduce the differential between Government charges and those of potential domestic private enrichers. We reviewed this proposal and concluded that it would be desirable for the Congress to retain control over establishing the basis for Government enrichment charges. 2/ Congress has not yet acted on the proposed change.

The Atomic Energy Act does not appear to prevent ERDA from charging foreign consumers more for separative work units than U.S. consumers, as long as the increase is cost-related, but bilateral agreements for cooperation may do so. We reviewed the agreements for cooperation with 13 countries expected to procure more than 1 million separative work units from the United States during 1977-86 and found that the agreements with Brazil and Japan contain clauses that stipulate the United States will provide uranium enrichment services at prices in effect for U.S. users at the time of delivery. However, the clause in the agreement with Japan applies only to enrichment service contracts concluded prior to December 21, 1973.

EFFECT OF SEPARATIVE WORK UNIT SURCHARGE

We reviewed ERDA data on expected separative work unit sales to determine which countries and U.S. consumers would be affected by a surcharge on these units. Projected sales for fiscal years 1977 through 1986 total 243 million units; 153 million, (63 percent) to be provided to U.S. consumers and 90 million (37 percent) to foreign customers.

1/ Review of Proposed Revisions to the Price and Criteria for Uranium Enrichment Services, (B-159697), July 17, 1970.

2/ Comments on Proposed Legislation to Change Basis for Government Charge for Uranium Enrichment Services, (RED-76-30), Sept. 22, 1975.

Foreign consumption

U.S. enrichment services are expected to be sold to 24 foreign countries and EURATOM through 1986. Sales of 1 million or more separative work units are expected to be made to only 13 countries during this same time frame. These 13 countries will procure 94 percent of the 90 million units to be sold to foreign countries, as shown in table 5.

Table 5

Expected Sales of Uranium Enrichment Services Abroad for 1977-1986

Less than a million separative work units		More than a million separative work units	
Country	Units (000 omitted)	Country	Units (000 omitted)
South Africa	982	Japan	27,171
Yugoslavia	736	Germany	14,950
Italy	719	Spain	10,249
Austria	717	Sweden	8,680
Portugal	500	Switzerland	4,412
Egypt	379	Republic of China	3,771
Israel	358	France	3,647
Philippines	352	Iran	2,530
United Kingdom	328	Belgium	2,227
Thailand	295	Brazil	2,024
Greece	217	Mexico	1,608
EURATOM	3	Korea	1,599
		Netherlands	1,522
Total	5,586		84,390
	(6 percent)		(94 percent)

Domestic consumers

Domestic separative work unit sales are expected to increase from 5 million in 1977 to 24 million in 1985 and to fluctuate between 22 million and 23 million from 1986 to 1991.

We arranged ERDA's projected data on domestic sales for 1977 to 1991 by State and by sales volume to determine which areas of the country could be expected to be most affected by a unit surcharge. The map on page 27 indicates how people living in each State might be affected by a surcharge. It should be noted, however, that power plants in one State do, in certain cases, provide power to consumers in another State and that the map and data below do not reflect this interstate flow of power.

Over the next 15 years, Illinois, Tennessee, Alabama, and Pennsylvania nuclear power facilities will each buy more than 15 million separative work units, and California, North and South Dakota, Virginia, New York, New Jersey, and Texas facilities are each expected to buy between 10 million and 15 million. On the other hand, no sales will be made in 14 States during the next 15 years, according to ERDA projections.

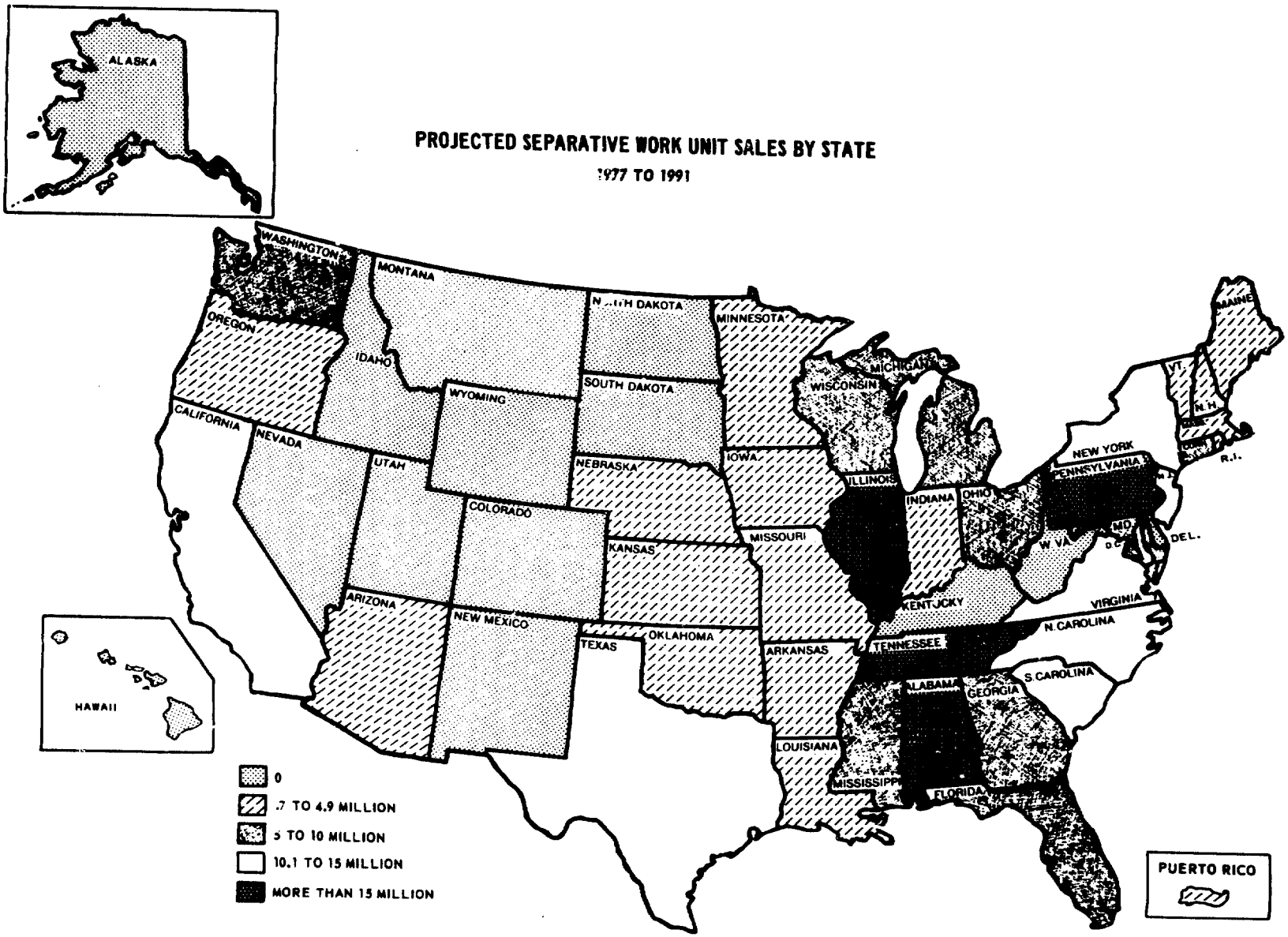
The impact of a $1 increase in the price per unit is not expected to have a significant effect on the electrical rates charged by utilities. Assuming that the increased costs were passed on, a $1 increase in the unit price would result in a .002 cent per kilowatt hour increase in consumer electrical rates. Based on the 1975 average price per kilowatt hour, this would amount to a 0.06 to 0.11 percent rate increase depending on whether the consumer is classified as residential, commercial, or industrial, as shown below.

Table 6

Impact on Consumer
If Price of Separative Work Unit
Were Increased By $1

	Residential	Commercial	Industrial
Average 1975 price per kilowatt hour (note a)	$0.032	$0.032	$0.019
Percent of price increase	0.06%	0.06%	0.11%
Average increase in annual electric bill per consumer	$0.16	$0.97	$32.00

a/ Source: Edison Electric Institute


PROJECTED SEPARATIVE WORK UNIT SALES BY STATE
1977 TO 1991
ALASKA
HAWAII
WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
S.CAROLINA
N.CAROLINA
VIRGINIA
W.VA.
PENNSYLVANIA
NEW YORK
MAINE
VT.
N.H.
MASS.
R.I.
CONN.
N.J.
MD.
DEL.
D.C.
0
.7 TO 4.9 MILLION
5 TO 10 MILLION
10.1 TO 15 MILLION
MORE THAN 15 MILLION
PUERTO RICO

COMPETITIVENESS OF U.S. PRICE

Currently, the United States and the Soviet Union supply almost all of the enriched uranium for commercial power plants in the world. The United Kingdom, France, and the People's Republic of China all have developed enrichment capabilities for their weapons programs. The Soviet Union has offered enrichment services to a number of Western European countries and Japan at prices equal to those of ERDA but under conditions considered more flexible and attractive than those offered by ERDA.

At this time, two European consortia, EURODIF and URENCO, are developing large-scale uranium enrichment facilities. EURODIF, a French-led group composed of France, Italy, Belgium, Spain, and Iran, plans to produce 10.8 million separative work units annually by the early 1980s and is currently advertising its price to be less than $100 per separative work unit. URENCO, composed of the United Kingdom, the Netherlands, and West Germany, projects an annual 5.9 million unit production by the early 1980s and initially plans to charge $93.60 per separative work unit.

ERDA's current price for enrichment services is considered to be substantially less than commercial facilities would charge if they were providing enrichment services. For example, legislation was proposed in 1975 that would have raised ERDA's charge per unit to $76, the estimated cost that commercial facilities, if available, would charge.

Due to the limited sources of enrichment services and the price now charged by ERDA, the U.S. separative work units seem likely to remain marketable even with a modest surcharge added to the price. However, any proposed increase in price should be accompanied by a determination of whether it would encourage nations to develop their own enrichment facilities. It is possible that U.S. sales of enrichment services could be adversely affected as enrichment services become increasingly available from other countries. U.S. policy is to discourage nations from developing their own enrichment capabilities in order to achieve non-proliferation objectives.

HEAVY WATER REACTORS

The proposal of a separative work unit surcharge would not affect the operations of heavy water reactors, as they are fueled by natural uranium rather than enriched uranium.

In this decade, more than 90 percent of the world's power reactors will rely on enriched uranium for their power source, and all power production reactors currently in commercial operation in the United States use enriched uranium. Nevertheless, the fact that about 10 percent of the world's power reactors in this decade will not be fueled by enriched uranium must be considered in evaluating the objectives of any separative work unit surcharge.

CONCLUSIONS

Applying a surcharge to the enrichment services provided by ERDA would seem to be a feasible method for generating revenues to support IAEA activities. It probably would not be difficult to implement and administer. Existing legislation would have to be changed, however, and appropriate administrative controls and procedures established to assure congressional oversight.

A modest surcharge would have no substantial impact on the rates charged by domestic utilities for electricity. However, it is important to recognize that foreign purchasers of U.S. enrichment services could view even a modest surcharge as inequitable, in that they would be required to partially fund U.S. contributions to IAEA in addition to paying their own assessed share directly to IAEA.

CHAPTER 6

FEASIBILITY OF SURCHARGES ON THE SALE OF NUCLEAR EQUIPMENT AND MATERIAL

We evaluated the feasibility of applying five different types of surcharges on nuclear equipment and material. Of the five alternatives, placing an excise tax on the manufacture of nuclear equipment and material was found to be feasible, although defining the tax base would be difficult. The other four methods pose problems of a constitutional and export-licensing nature.

EXCISE TAX ON NUCLEAR EQUIPMENT AND MATERIAL

An ad valorem excise tax on the manufacture of nuclear equipment would be a fixed percent of the manufacturer's selling price of the product and would be assessed prior to shipment. According to a 1975 Commerce report, 110 domestic companies had annual sales of about $1.3 billion in selected atomic energy products in both 1974 and 1975, as shown below. The figures include certain items not related to nuclear power, such as self-illuminating materials and medical equipment.

Table 7

Selected Atomic Energy Product Sales

Purchaser	1974 (000 omitted)	1974 Percent	1975 (000 omitted)	1975 Percent
Domestic firms	$ 738,504	54	$ 737,620	55
Foreign entities	214,754	16	210,432	16
U.S. Government	407,896	30	390,361	29
Total	$1,361,154	100	$1,338,413	100

Assuming this sales mix will remain relatively unchanged, domestic firms would pay 55 percent of the tax, foreign purchasers 16 percent, and the U.S. Government 29 percent. If the total 1975 U.S. support ($10 million) to IAEA had been funded by an excise tax, the tax rate

would have been 0.75 percent. We must caution, however, that fluctuations in sales or the level of support to IAEA may necessitate changes in the excise tax rate. As discussed previously, U.S. support has increased steadily.

The Chief of Excise Taxation of the Department of the Treasury explained that developing a definition of what equipment or material would be subject to the excise tax would be one of the most difficult steps in implementing any such tax. The technology of the nuclear industry and the resulting new equipment would tend to quickly outdate any product listing designated as a tax base. He noted that such a proposed excise tax would probably encounter some opposition because it would conflict with previous efforts to gradually reduce the number of excise taxes and because legislation implementing excise taxes has generally exempted exports in order to preserve U.S. competitiveness.

Generally, excise taxes are reasonably economical to administer. Reliance is placed primarily on the manufacturer to keep adequate records to establish the correct tax liability. The Treasury official advised us that the costs associated with the system would vary with the number of legal rulings required and the number of tax audits performed. The number of rulings could be expected to be high if the tax base was inadequately defined or the tax returns were questioned by the Internal Revenue Service. The number of audits would depend on the degree of assurance sought that manufacturers were in compliance with the tax.

SURCHARGE ON EXPORT VALUE OF EQUIPMENT AND MATERIAL

The Nuclear Regulatory Commission licenses the export of complete or essentially complete utilization facilities (reactors), special nuclear material, source material, and byproduct material.

The Department of Commerce licenses (1) specially designed components of nuclear reactors that constitute substantially less than complete reactors, (2) maritime (civil) nuclear propulsion equipment and technology, (3) items for both military and peaceful nuclear uses, such as computers, high-speed cameras, and neutron generators, and (4) radioactive isotopes not produced in nuclear reactors.

The value of nuclear equipment and material licensed by NRC and Commerce for export is shown below. It should be noted that these amounts are authorized export ceilings under licenses and do not necessarily represent actual shipments or sales.

Table 8
Value of Nuclear Equipment And Material Licensed for Export

	Calendar year 1975	1976
	(millions)	
NRC (note a)	$ 38.0	$ 38.1
Commerce	108.8	93.0
Total	$146.8	$131.1

a/ Does not include value of nuclear material, since NRC licenses such material by quantity and not dollar value.

Applying a surcharge on nuclear equipment and material licensed for export appears to conflict with the constitutional prohibition on the taxing of exports. Furthermore, NRC licenses authorize dollar values rather than specific components and it is questionable whether these authorized dollar values represent an adequate basis for applying a surcharge to exports, since they are only ceilings on what manufacturers may export, not actual export values. Additionally, actual exports may not occur until several years after the license is issued, if at all.

The value of actual exports are recorded by Customs Officers on the back of the licenses when equipment is exported. When the ceiling is reached or the license expires, the Customs Service returns the license to NRC or Commerce and it is not until then that NRC or Commerce have an accounting of actual exports. Therefore, while collection of the surcharge by NRC and Commerce when the license is approved would be the simplest method, the problem of providing rebates on authorized but uncompleted exports would have to be resolved.

NRC licenses the possession and use of nuclear materials and the operation of production and utilization facilities domestically. However, domestic licenses do not reflect the value of nuclear equipment sold for use within

the United States. It is not possible to apply percentage surcharges to the value of both domestic and export sales through licensing procedures without comparable data.

To construct nuclear facilities within the United States, applicants must obtain a permit and submit an environmental impact statement for each facility, which includes an estimate of the cost. That estimate, however, includes all costs of the domestic facility (surveying, land development, security, etc.) while the value of only certain equipment and material is shown in export licenses.

SURCHARGE ON MEGAWATT CAPACITY OF NUCLEAR PLANTS EXPORTED

Applying a surcharge on the megawatt capacity of nuclear power plants licensed by NRC for export was found to be inadequate because of the constitutional question regarding taxes on exports and because the capacity of plants licensed by NRC is not directly related to the value of equipment procured in the United States for those plants.

Smaller sized plants have been sold at higher prices than much larger plants, and similarly sized plants have been sold at a wide range of prices. For example, an 812-electrical megawatt reactor was exported at an estimated cost of $12.5 million while an 813-electrical megawatt reactor was exported at an estimated cost of $39.9 million. An NRC official explained that some countries with more advanced technological capabilities do not require all the parts and materials that a less developed country needs to construct the same plant. Hence, the wide variation in sales price results from what the country requires from U.S. suppliers to construct the plant.

Another problem of using the megawatt capacity as a basis for generating the revenue for IAEA is the fluctuation in the number and the total megawatt capacities of plants exported, as shown below.

Table 9

Megawatt Capacity of Reactors Licensed for Export

Calendar year	Number of reactors	Megawatt capacity
1972	2	1,182
1973	14	12,075
1974	7	5,918
1975	2	1,927
1976	2	1,796

FLAT FEE SURCHARGE ON EXPORT LICENSES

A flat fee on each Commerce and NRC export license was deemed an inadequate method for generating substantial revenues due to the relatively small number of licenses being issued. Also, the constitutional issue of such a fee being considered an export tax is also present.

In calendar year 1976, NRC and Commerce granted a total of 512 export licenses. To yield $10 million for support of IAEA, a flat fee of $19,531 would have to be charged for each license issued, and this in many instances would exceed the value of the item exported. For example, one license authorized the export of 112 grams of slightly enriched uranium valued at $58.12.

SURCHARGE ON EXPORT-IMPORT BANK FINANCING

The Export-Import Bank of the United States finances a substantial amount of nuclear-related equipment and material. The Bank is an independent corporate agency of the U.S. Government which facilitates the export of U.S. goods and services through direct financing and commercial and political risk insurance and guarantees.

From April 1974 through December 1975, the Bank authorized nearly $1.1 billion in direct loans to assist the export of nine nuclear power plants or related equipment and services to five countries, as shown below.

Table 10

Export-Import Bank Financing
of Nuclear Projects
April 1974 - December 1975

Date authorized	Country	Number of plants	U.S. export value (millions)	Bank credit (millions)
Apr. 25, 1974	Taiwan	2	$498.7	$199.5
May 9, 1974	Yugoslavia	1	195.6	205.5
June 30, 1975	Korea	1	292.4	131.6
Sept. 15, 1975	Spain	2	326.0	130.4
Dec. 18, 1975	Spain	2	269.3	148.1
Dec. 18, 1975	Philippines	1	616.4	277.2
Total (5 countries)		9	$2,198.4	$1,092.3

Source: Statement of Stephan M. Minikes, Senior Vice-President of the Bank, before the Subcommittee on International Trade, Investment and Monetary Policy, House Committee on Banking, Currency and Housing, May 10, 1976.

In May 1976, a Bank official estimated that the Bank's average direct loan for nuclear-related equipment and services could range from $550 million to $850 million through 1980.

We considered the prospects of an annual surcharge on the unpaid balance of the Bank's direct loans for financing nuclear-related exports. However, we found that such a surcharge might be held to be an export tax and, therefore, unconstitutional, as discussed earlier. The surcharge would also tend to be contrary to the purposes of Export-Import Bank loans, would not generate substantial revenues immediately, and would be applied to loans for which the total value fluctuates annually. Such a surcharge would not generate significant funds immediately because actual drawings against a loan authorization often occur over an extended period of time and repayments do not begin immediately.

To generate $10 million, a 2-percent surcharge would have to be applied on the estimated average $550 million in annual direct financing that may be provided through

1980. This could represent a significant interest burden, considering that the Bank's purpose is to promote exports by offering low-interest financing. However, the amount of the surcharge might be reduced as the outstanding cumulative balance of nuclear-related loans increased.

CONCLUSIONS

Of the five methods considered for generating revenues for IAEA by applying a surcharge on nuclear equipment and material, only the excise tax appears to pass the constitutional restriction prohibiting a duty or tax on exports, since it would be applied to items destined for domestic use as well as for export and would be imposed before the items were actually exported. Under this method, however, U.S. Government agencies might pay about 30 percent of the tax. Moreover, implementing procedures and defining the excise tax base may be difficult in the rapidly changing field of nuclear technology.

The other methods would encounter problems because:

--A fixed fee per license would have to be quite high because the number of NRC and Commerce licenses issued annually is small.

--The amounts listed on NRC and Commerce licenses represent authorized limits rather than actual values of items exported.

--A fee based on the megawatt capacity of nuclear power plants exported would be inequitable since the value of the equipment procured in the United States bears no relationship to the capacity of the plants actually built.

--A surcharge on Export-Import Bank loans for nuclear-related goods and services would run at cross purposes to the goals of such financing.

CHAPTER 7

OVERALL CONCLUSIONS

We are not recommending that the current method of U.S. funding of IAEA through general revenues be changed. Our review of various alternative funding mechanisms showed that most of the alternatives we considered would encounter legal problems or would be impractical. A few offered some potential, but each of these also had disadvantages. We also noted that any change from the present method might set a precedent and create pressure for funding other international organizations through separate revenue-raising schemes.

Under the current method, U.S. support to IAEA is paid for by the general public. The merits of alternative methods arise if a determination is made that the population as a whole does not benefit from U.S. support to IAEA and that the nuclear industry and its customers should pay for such U.S. support.

We studied the feasibility of generating revenues through a surcharge on nuclear power plants operating in the United States and concluded that such a surcharge might be possible. Similar fees were once used to offset the cost of nuclear regulatory activities. After the Supreme Court held that annual operating fees used by other agencies were invalid, NRC halted collection of such fees. Moreover, to generate sufficient revenues, the fee would have to be substantially greater than previous fees. For example, the old fee was a minimum of $20,000, and to support IAEA, the fee would have to be $154,000.

Our review showed that applying a surcharge to uranium enrichment services for both domestic and foreign customers appeared to have some potential. A modest surcharge on such services would not have any substantial impact on the American consumer (about 16 cents annually per residential user). However, foreign customers would probably view such a surcharge as inequitable in that they would be required to partially fund U.S. contributions to IAEA in addition to providing their own direct financial support to IAEA. Japan, for example, might have to pay about $27 million of U.S. support to IAEA over the next 10 years.

Applying an excise tax to the manufacture of nuclear equipment offers some potential. However, under this method the U.S. Government would still pay approximately 30 percent of the tax. Moreover, defining the excise tax base may be difficult in the rapidly changing field of nuclear technology.

The Constitution appears to preclude the establishment of a surcharge on the export of nuclear material and equipment. Additionally, there would be practical problems in implementing such a surcharge. For example:

--A fixed fee per export license would have to be about $19,500 because the number of licenses issued annually is small.

--The value on export licenses for equipment represents authorized limits, not the value of items exported.

--A fee based on electrical capacity of reactors exported would be inequitable because the value of equipment exported bears no direct relationship to the capacity of the reactor.

--A surcharge on Export-Import Bank loans for nuclear goods and services would run at cross-purposes to the goals of such financing.

An important factor in analyzing alternatives is the degree of congressional control retained. Another issue is the time and effort required to administer the collection and distribution of funds under the alternatives in relationship to the desired target amount of support. The current system provides for congressional oversight, and no additional effort is needed to collect the funds.

Our study also showed that the International Atomic Energy Agency cannot adequately project its future funding needs because of numerous uncertainties and that it may not have the ability to effectively absorb any future substantial increases in safeguards-related assistance.

APPENDIX I

United States Senate
COMMITTEE ON
GOVERNMENT OPERATIONS
WASHINGTON, D.C. 20510

October 22, 1976

Honorable Elmer B. Staats
Comptroller General
General Accounting Office
441 G Street
Washington, D.C. 20548

Dear Mr. Staats:

One of the most important problems in the area of safeguards on nuclear exports has to do with the financing of the activities of the International Atomic Energy Agency (IAEA). Present U.S. assistance to the IAEA takes a number of forms, but is chiefly in the nature of direct monetary grants.

It is my intention as Ad Hoc Chairman for Nuclear Affairs of the Senate Committee on Government Operations, to hold hearings early in the first session of the 95th Congress on the subject of alternative methods of financing IAEA activities. It would be quite useful to me if the GAO would study this subject and produce a report prior to such hearings. Dr. Leonard Weiss of my staff has been in contact with the International Division of GAO in connection with this matter, and should be contacted for further details concerning my request.

Best regards.

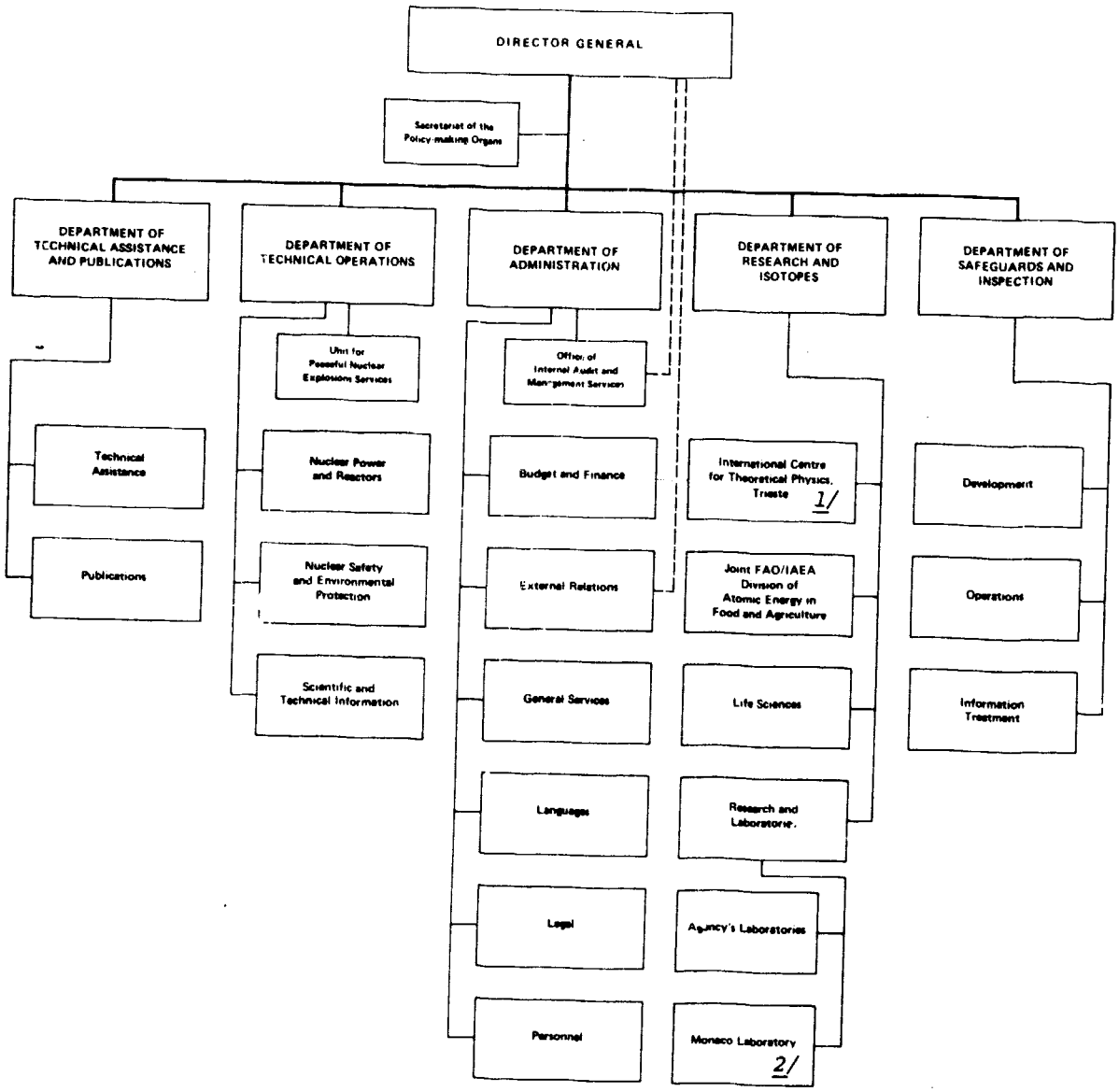
Sincerely,

John Glenn
United States Senator

JG/lwo

APPENDIX II

INTERNATIONAL ATOMIC ENERGY AGENCY ORGANIZATIONAL CHART



1/ Jointly operated by the Agency and the United Nations Education, Scientific and Cultural Organization.

2/ With the increasing participation of the United Nations Educational, Scientific and Cutural Organization, and the United Nations Environment Program.

SOURCE: The Agency's Programme for 1977-82, IAEA Document GC (XX)/567.

APPENDIX III

IAEA MEMBERS 1977 ASSESSMENTS

Member	Base rate of assessment	Assessment		Total	Scale of assessment
		Non-safeguards component	Safeguards component		
(1)	(%) (2)	($) (3)	($) (4)	($) (5)	(%) (6)
Afghanistan	0.02	5 813	754	6 567	0.01775
Albania	0.02	5 813	754	6 567	0.01775
Algeria	0.08	23 251	2 746	25 997	0.07026
Argentina	0.86	249 950	29 519	279 469	0.75532
Australia	1.49	433 054	125 832	558 886	1.51050
Austria	0.58	168 571	48 982	217 553	0.58798
Bangladesh	0.08	23 251	3 432	26 683	0.07211
Belgium	1.09	316 798	92 052	408 850	1.10500
Bolivia	0.02	5 813	754	6 567	0.01775
Brazil	0.80	232 512	27 460	259 972	0.70263
Bulgaria	0.15	43 596	5 148	48 744	0.13174
Burma	0.03	8 719	1 029	9 748	0.02635
Byelorussian Soviet Socialist Republic	0.48	139 507	40 536	180 043	0.48660
Canada	3.29	956 205	277 844	1 234 049	3.33527
Chile	0.15	43 596	5 148	48 744	0.13174
Colombia	0.17	49 409	5 835	55 244	0.14931
Costa Rica	0.02	5 813	754	6 567	0.01775
Cuba	0.11	31 970	3 775	35 745	0.09661
Cyprus	0.02	5 813	754	6 567	0.01775
Czechoslovakia	0.92	267 389	77 695	345 084	0.93266
Democratic Kampuchea	0.02	5 813	754	6 567	0.01775
Democratic People's Republic of Korea	0.07	20 345	2 402	22 747	0.06148
Denmark	0.65	188 916	54 893	243 809	0.65894
Dominican Republic	0.02	5 813	754	6 567	0.01775
Ecuador	0.02	5 813	754	6 567	0.01775
Egypt	0.12	34 877	4 119	38 996	0.10539
El Salvador	0.02	5 813	754	6 567	0.01775
Ethiopia	0.02	5 813	754	6 567	0.01775
Finland	0.44	127 882	37 159	165 041	0.44606
France	6.07	1 764 185	512 617	2 276 802	6.15352
Gabon	0.02	5 813	754	6 567	0.01775
German Democratic Republic	1.26	366 206	106 408	472 614	1.27733
Germany, Federal Republic of	7.35	2 136 204	620 715	2 756 919	7.45113
Ghana	0.04	11 625	1 373	12 998	0.03513
Greece	0.33	95 911	11 327	107 238	0.28983
Guatemala	0.03	8 719	1 029	9 748	0.02635
Haiti	0.02	5 813	754	6 567	0.01775
Holy See	0.02	5 813	1 698	7 502	0.02028
Hungary	0.34	98 818	28 713	127 531	0.34468
Iceland	0.02	5 813	1 689	7 502	0.02028
India	1.24	360 394	42 563	402 957	1.08907
Indonesia	0.20	58 128	6 865	64 993	0.17566
Iran	0.21	61 034	17 735	78 769	0.21289
Iraq	0.05	14 532	1 716	16 248	0.04391
Ireland	0.16	46 502	13 512	60 014	0.16220
Israel	0.22	63 941	18 579	82 520	0.22302
Italy	3.73	1 084 087	315 002	1 399 089	3.78132
Ivory Coast	0.02	5 813	754	6 567	0.01775
Jamaica	0.02	5 813	943	6 756	0.01826
Japan	7.40	2 150 736	624 938	2 775 674	7.50182
Jordan	0.02	5 813	754	6 567	0.01775
Kenya	0.02	5 813	754	6 567	0.01775
Korea, Republic of	0.11	31 970	3 775	35 745	0.09661
Kuwait	0.09	26 157	7 600	33 757	0.09123
Lebanon	0.03	8 719	1 029	9 748	0.02635

APPENDIX III

(1)	(2)	(3)	(4)	(5)	(6)
Liberia	0.02	5 813	754	6 567	0.01775
Libyan Arab Republic	0.11	31 970	9 290	41 260	0.11151
Liechtenstein	0.02	5 813	1 689	7 502	0.02028
Luxembourg	0.04	11 625	3 378	15 003	0.04055
Madagascar	0.02	5 813	754	6 567	0.01775
Malaysia	0.07	20 345	2 402	22 747	0.06148
Mali	0.02	5 813	754	6 567	0.01775
Mauritius	0.02	5 813	754	6 567	0.01775
Mexico	0.89	258 670	30 549	289 219	0.78167
Monaco	0.02	5 813	1 689	7 502	0.02028
Mongolia	0.02	5 813	754	6 567	0.01775
Morocco	0.06	17 438	2 059	19 497	0.05269
Netherlands	1.28	372 019	108 097	480 116	1.29781
New Zealand	0.29	84 285	24 490	108 775	0.29398
Niger	0.02	5 813	754	6 567	0.01775
Nigeria	0.10	29 064	3 432	32 496	0.08783
Norway	0.45	130 788	38 003	168 791	0.45619
Pakistan	0.15	43 596	5 148	48 744	0.13174
Panama	0.02	5 813	754	6 567	0.01775
Paraguay	0.02	5 813	754	6 567	0.01775
Peru	0.07	20 345	2 402	22 747	0.06148
Philippines	0.19	55 221	6 522	61 743	0.16687
Poland	1.31	380 738	110 631	491 369	1.32802
Portugal	0.16	46 502	5 492	51 994	0.14052
Qatar	0.02	5 813	1 689	7 502	0.02028
Republic of South Viet-Nam	0.06	17 438	2 059	19 497	0.05269
Romania	0.31	90 098	10 640	100 738	0.27226
Saudi Arabia	0.06	17 438	2 059	19 497	0.05269
Senegal	0.02	5 813	754	6 567	0.01775
Sierra Leone	0.02	5 813	754	6 567	0.01775
Singapore	0.04	11 625	1 373	12 998	0.03513
South Africa	0.52	151 133	17 849	168 982	0.45671
Spain	1.03	299 359	35 011	334 370	0.90370
Sri Lanka	0.03	8 719	1 029	9 748	0.02635
Sudan	0.02	5 813	943	6 756	0.01826
Sweden	1.35	392 364	114 009	506 373	1.36857
Switzerland	0.85	247 044	71 783	318 827	0.86169
Syrian Arab Republic	0.02	5 813	754	6 567	0.01775
Thailand	0.11	31 970	3 775	35 745	0.09661
Tunisia	0.02	5 813	754	6 567	0.01775
Turkey	0.39	87 192	10 297	97 489	0.26348
Uganda	0.02	5 813	754	6 567	0.01775
Ukrainian Soviet Socialist Republic	1.77	514 433	149 479	663 912	1.79436
Union of Soviet Socialist Republics	13.43	3 903 295	1 134 177	5 037 472	13.61479
United Arab Emirates	0.02	5 813	1 689	7 502	0.02028
United Kingdom of Great Britain and Northern Ireland	5.50	1 598 520	464 481	2 063 001	5.57568
United Republic of Cameroon	0.02	5 813	754	6 567	0.01775
United Republic of Tanzania	0.02	5 813	754	6 567	0.01775
United States of America	27.51	7 995 507	2 323 246	10 318 753	27.88852
Uruguay	0.06	17 438	2 059	19 497	0.05269
Venezuela	0.33	95 911	11 327	107 238	0.28983
Yugoslavia	0.35	101 724	12 013	113 737	0.30740
Zaire	0.02	5 813	943	6 756	0.01826
Zambia	0.02	5 813	754	6 567	0.01775
TOTAL	100.00	29 064 000	7 936 000	37 000 000	100.00000

SOURCE: IAEA Document GC (XX)/570, 20 August 1976.

APPENDIX IV

DESCRIPTION OF IAEA SAFEGUARDS ORGANIZATION AND 1977 AND 1978 BUDGETS

In August 1976, IAEA published its budget estimate for 1977 and preliminary budget estimate for 1978. We discussed the safeguards portions of the 1977 and 1978 budgets with IAEA officials to learn how the (1) safeguards function is organized, (2) program requirements are developed, and (3) needed level of inspection is estimated.

ORGANIZATION

The Department of Safeguards and Inspections is organized into four subprograms directed and coordinated by the IAEA Inspector General. Staffing and costs for each subprogram are shown in table 11.

The largest subprogram, both in terms of personnel and funds budgeted, is safeguards operations. Its main activities include evaluating nuclear materials accountancy and performing inspections. In 1976, IAEA was applying safeguards under 63 agreements, in 43 countries, and at over 300 facilities. The 1977 budget estimated that facilities under IAEA safeguards would increase to over 500 during 1977.

Safeguards development is the second largest subprogram, measured in personnel and funds budgeted. It directly supports operations by providing procedures, techniques, and equipment for achieving the technical objectives of safeguards.

Safeguards information treatment is the third largest subprogram. Its main activities include operating and further developing a computer-based data processing system which handles reports on inventories and movements of nuclear material.

The least costly subprogram is standardization. Its main activities include codifying administrative procedures for implementing safeguards and participating in negotiating safeguards agreements and their subsidiary arrangements to insure consistency of technical, administrative, and legal requirements.

Table 11

Staffing and Costs of Safeguards Division Subprograms

Subprogram	1977 estimate Staff years Professional	Support	Costs (000 omitted)	1978 Preliminary estimate Staff years Professional	Support	Costs (000 omitted)
Program coordination (note a)	2	3	$ 773	2	3	$ 745
Safeguards operations	74	21	3,771	85	28	4,653
Safeguards development	20	8	2,089	20	8	2,264
Standardization	3	4	197	3	4	214
Safeguards information treatment	12	14	1,121	12	14	1,235
Total	111	50	$7,951	122	57	$9,111

a/ Program coordination refers to the Inspector General and his administrative officer and their support staff.

SOURCE: The Agency's Programme for 1977-82, IAEA Document GC (XX)/567.

APPENDIX IV

1977 BUDGET ESTIMATE

Table 12 shows Actual and estimated costs of the safeguards program for 1975-78 and changes expected from 1976 to 1977.

As shown in the table, the 1977 budget estimates were developed from the 1976 program and budget. Changes in an expenditure item are attributed to price changes or to an increase or decrease in program activity; 14.5 percent of the 23.4 percent increase in the budget was a result of program changes.

Division of Operations

Below is a summary of the Division's manpower and cost estimate for 1977.

Program component	Staff years		Cost		
	Professional	Support	Staff	Other	Total
Safeguards operations	74	21	$2,925,500 a/	$443,500	$3,369,000
Linguistic, printing and publishing services	--	--	--	96,000	96,000
Laboratory services	--	--	--	200,000	200,000
Legal services	--	--	--	106,000	106,000
Total	74	21	$2,925,500	$845,500	$3,771,000

a/ Personnel costs.

APPENDIX IV

Table 12

Cost of IAEA's Safeguards Program

Item of expenditure	1975 Actual obligations	1976 Adjusted budget	Increase or (decrease) from 1976			1977 Estimate	1978 Preliminary estimate
			Price	Programme	Total		
Salaries and wages							
Established posts	2 375 032	3 158 000	280 000	277 000	557 000	[a] 3 715 000	4 382 000
Consultants	39 573	21 000	600	20 400	21 000	42 000	47 000
Overtime	205	1 000	-	1 000	1 000	2 000	2 000
Temporary assistance	862	-	-	5 000	5 000	5 000	5 000
Sub-total	2 415 972	3 180 000	280 600	303 400	584 000	3 764 000	4 436 000
Common staff costs	709 100	917 000	113 500	86 500	200 000	[b] 1 117 000	1 316 000
Travel	350 638	410 000	17 400	87 600	105 000	[c] 515 000	610 000
Meetings							
Conferences, symposia, seminars	36 659	-	-	30 000	30 000	30 000	55 000
Technical committees, advisory groups	37 342	67 000	3 500	13 500	17 000	84 000	76 000
Representation and hospitality	9 323	8 000	1 000	2 000	3 000	11 000	12 000
Scientific and technical contracts	143 902	490 000	10 000	(14 000)	(4 000)	486 000	550 000
Scientific supplies and equipment	406 217	510 000	41 000	27 000	68 000	578 000	543 000
Common services, supplies and equipment	44 226	-	-	-	-	-	-
Transfer of costs:							
Linguistic services	122 072	75 000	8 000	73 000	81 000	156 000	148 000
Printing and publishing services	57 541	69 000	6 000	5 000	11 000	80 000	90 000
Data processing services	151 175	125 000	13 000	262 000	275 000	[d] 400 000	500 000
Laboratory services	381 468	496 000	72 000	56 000	128 000	[e] 624 000	663 000
Other: Legal services	96 000	96 000	10 000	-	10 000	106 000	112 000
TOTAL	4 961 633	6 443 000	576 000 8.9%	932 000 14.5%	1 508 000 23.4%	7 951 000	[f] 9 111 000

SOURCE: The Agency's Programme for 1977-82, IAEA Document GC (XX)/567.

APPENDIX IV

Notes to Table 12

a/ Accounts for 46.7 percent of the total 1977 safeguards budget, representing only salaries of professional and general services staff; based on detailed inventory of current staff by individual position and estimates of staff to be recruited by grade and reporting date.

b/ Includes benefits and allowances for established posts, such as home leave, separation, health insurance, IAEA's share of U.N. pension, and other allowances; these costs average 30 percent of established posts' salary costs.

c/ $420,000 is related to inspections; $95,000 is for travel costs for attending meetings, conferences, seminars, training, and so forth.

d/ Increase reflects move toward greater automation of safeguards reports and analyses and represents Department of Safeguards and Inspection's share of IAEA's computer cost. This estimate predates the decision to obtain a new computer so it may not currently be valid.

e/ Costs for analyzing inspection samples.

IAEA's inspection workload is based on safeguards agreements between IAEA and member countries. These agreements describe in general the scope of safeguards to be applied. Appended to the agreements are facilities attachments specifying the inspection approach required by the characteristics of individual facilities.

According to IAEA officials, inspection effort varies greatly between different types of facilities as well as between facilities of the same type. For example, one of the most frequently inspected type of facility--light-water power reactors--requires between 8 and 15 staff days per year to safeguard. This usually is supplemented by one or two automatic surveillance cameras and seals on nuclear material containers. A medium-sized fuel fabrication plant in which low enriched uranium is handled in bulk requires between 75 and 100 inspection staff days per year to safeguard.

To estimate the total inspection staff days at facilities for the budget year, a projection of the new workload must be added to the prior year's known workload. The projections are based on IAEA's estimates of when safeguards agreements are expected to come into force and how many

APPENDIX IV

staff days will be spent at each facility covered by the agreements. The actual implementation date depends on when the country involved approves the agreement.

In 1976, IAEA used 1,500 inspector staff days at facilities. An IAEA official gave us an official estimate of 2,000 inspection staff days at facilities for 1977. These estimates represent the time spent inspecting facilities only and do not include travel time to and from Vienna and discussion time for the inspectors. For example, the factor for such time for Japan is 1, and for European countries it is around 0.4 to 0.5. Staff days at facilities are increased by the travel and discussion time factors to show total inspection time. Total staff days of inspection effort are then increased by a factor of 2 for time used in developing inspection reports, administrative work, training, and so forth, to show total inspector staff days required.

On the average, IAEA obtains 216 staff days per staff year. Therefore, personnel needs are determined by dividing total number of inspector staff days required by 216 to arrive at the staff years of inspection effort needed. For 1977, 74 staff years were estimated for the Operations Division professional staff--which includes inspectors, section chiefs, an accounts and reports section, and a reserve of about 15 staff years for expected recruitment of inspectors, primarily for EURATOM--plus 21 staff years for general services staff (clerks, typists, etc.). From these detailed staff year requirement estimates, salaries costs are projected on a position by position basis.

Since the type and number of facilities to be covered by voluntary agreements between the United States, the United Kingdom, and IAEA are not yet known, the inspection workload in these countries was not included in the budget estimate for 1977.

PRELIMINARY BUDGET ESTIMATE FOR 1978

The 1978 preliminary budget estimate for safeguards costs of $9.1 million (see table 12 for details) was developed during 1976. It is based on the 1977 budget estimates and adjusted for expected costs and program changes, including increasing inspection workload.

Our discussions with IAEA officials revealed that preliminary estimates for 1978 were low and are presently being revised. Because the revisions have not been finalized, IAEA officials would not provide the detailed estimates.

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As most of the Department of Safeguards and Inspection's costs are for personnel, staff growth will be a major factor in the growth of safeguards costs. Most of the growth has been and will be for additional safeguards inspectors in the Operations Division, whose costs were estimated at $4,653,000, or 51 percent of the total 1978 safeguards budget.

According to the Inspector General, some growth is now expected in non-inspection divisions' staff during 1978. Although the preliminary estimate shows no staff increases, five more people should be added to the Development Division. Continued growth in volume of safeguards reports processed by computer is expected to warrant some growth in the Safeguards Information Treatment Division staff.

The United States has negotiated a safeguards agreement with IAEA pursuant to a U.S. voluntary offer to accept safeguards on civil facilities. Officials said the safeguards agreement with the United States might be implemented during 1978. U.S. Mission officials have stated that the time of entry into force of the agreement will be determined by various factors, including IAEA safeguards implementation in Japan and in non-nuclear weapons states of EURATOM.

IAEA expenses involved in carrying out IAEA safeguards responsibilities under the U.S. agreement will be borne by IAEA. The Director General has estimated that the incremental expenses incurred by the Agency during the first year of implementation will be about $150,000. This figure is exclusive of inspector and support costs already included in the budget.

APPENDIX V

TASKS BEING CONSIDERED FOR FUNDING FROM APPROPRIATIONS MADE FOR IAEA SAFEGUARDS

1. Upgrade IAEA measurement technology by demonstrating field measurement technologies in U.S. facilities and by providing experts in the measurement technology field, newly developed nondestructive assay equipment, and radiation detection elements.

2. Provide safeguards training to IAEA staff, personnel from member countries, and facility operators in materials accountancy, conduct of inspections, control and measure of nuclear material, and other specialized topics.

3. Support system studies for upgrading IAEA safeguards, including the examination of activities (involving the entire fuel cycle) required to apply IAEA safeguards and the construction of general system analysis models for (a) forecasting the application of IAEA inspection efforts and (b) assessing the impact of safeguards criteria.

4. Support IAEA safeguards processing by assisting IAEA to acquire a new computer system and remote data terminals; recruit U.S. personnel for positions at IAEA; study and complete conversion of existing statistical packages; and conduct studies and evaluations for training, forms design, and technical and resource requirements.

5. Assist IAEA in containment and surveillance techniques by providing hardware (flow monitors, surveillance systems, seals, and detectors), modifying existing hardware, performing new design work, and providing personnel to train IAEA inspectors in the use of the equipment.

6. Support IAEA field operations by assisting IAEA to (a) evaluate the effectiveness of safeguards using the data gathered during inspections, (b) evaluate the data accumulated from testing new procedures to determine the procedures' simplicity and ease of application, and (c) improve field-data collection procedures to upgrade data quality.