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PUBLIC WORKS APPROPRIATIONS, 1964

GOVERNMENT

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HEARINGS
BEFORE THE
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
EIGHTY-EIGHTH CONGRESS

FIRST SESSION

ON

H.R. 9140

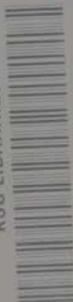
MAKING APPROPRIATIONS FOR CIVIL FUNCTIONS ADMIN-
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AGENCIES OF THE DEPARTMENT OF THE INTERIOR, THE
ATOMIC ENERGY COMMISSION, THE TENNESSEE VALLEY
AUTHORITY, AND CERTAIN STUDY COMMISSIONS, FOR
THE FISCAL YEAR ENDING JUNE 30, 1964, AND FOR
OTHER PURPOSES

ATOMIC ENERGY COMMISSION
TENNESSEE VALLEY AUTHORITY

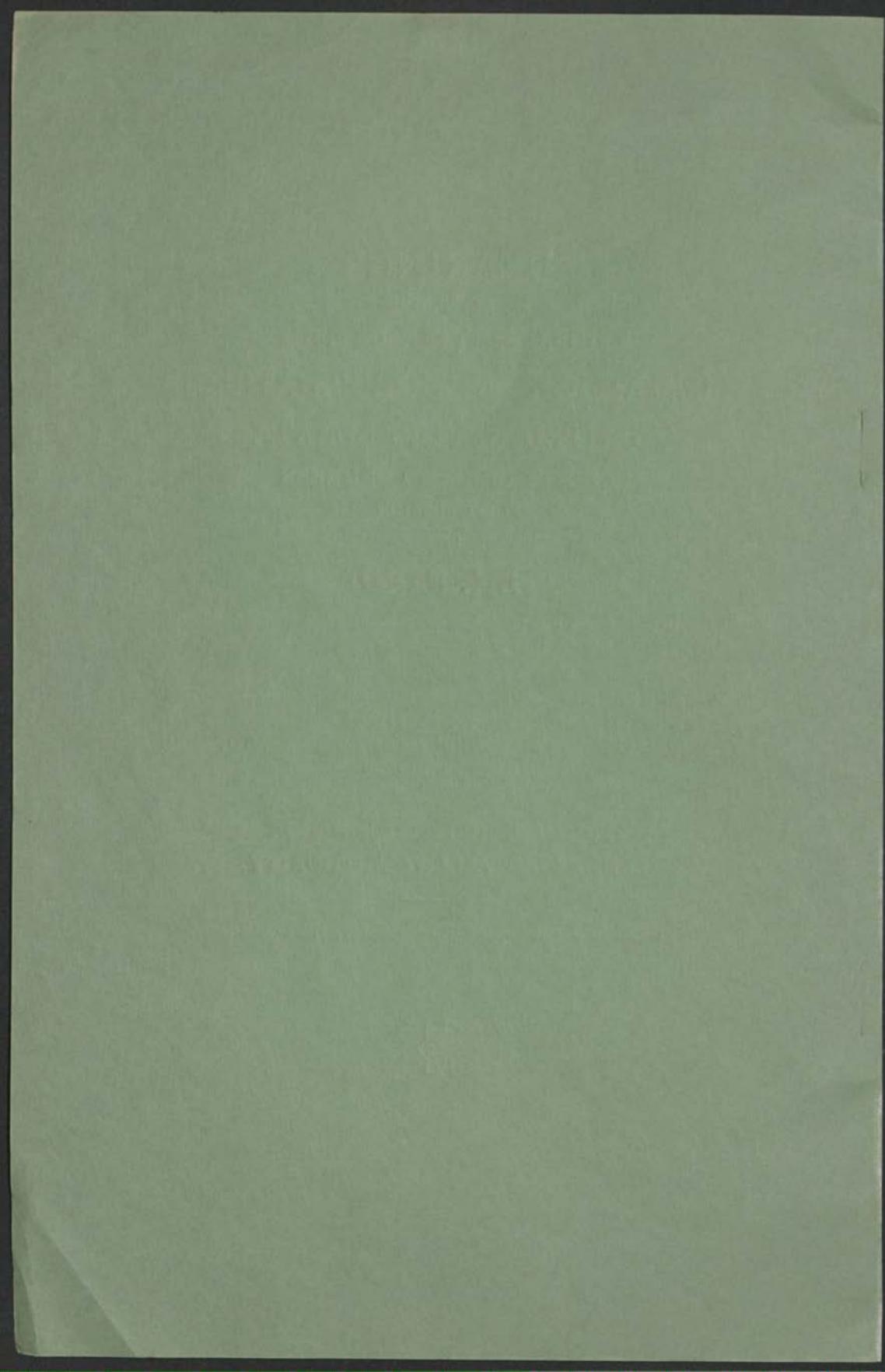
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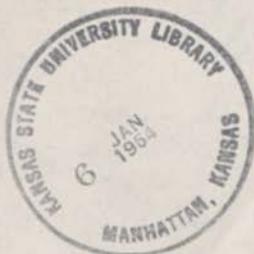
ATOMIC ENERGY COMMISSION
TENNESSEE VALLEY AUTHORITY

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PUBLIC WORKS APPROPRIATIONS FOR 1964

TUESDAY, NOVEMBER 19, 1963

U.S. SENATE,
SUB-SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to notice, in room S. 126, the Capitol Building, Senator Lister Hill (chairman of the subcommittee) presiding.

Present: Senators Hill, Pastore, and Bible.

ATOMIC ENERGY COMMISSION

STATEMENT OF DR. GLENN T. SEABORG, CHAIRMAN, ACCOMPANIED BY A. R. LUEDECKE, GENERAL MANAGER; GEORGE F. QUINN, ASSISTANT GENERAL MANAGER FOR PLANS AND PRODUCTION; DR. SPOFFORD G. ENGLISH, ASSISTANT GENERAL MANAGER FOR RESEARCH AND DEVELOPMENT; JOSEPH F. HENNESSEY, GENERAL COUNSEL; JOHN P. ABBADESSA, CONTROLLER; R. L. FAULKNER, DIRECTOR, DIVISION OF RAW MATERIALS; FRANK P. BARANOWSKI, DIRECTOR, DIVISION OF PRODUCTION; MAJ. GEN. A. W. BETTS, DIRECTOR, DIVISION OF MILITARY APPLICATION; DR. FRANK K. PITTMAN, DIRECTOR, DIVISION OF REACTOR DEVELOPMENT; DR. PAUL W. McDANIEL, DIRECTOR, DIVISION OF RESEARCH; DR. CHARLES L. DUNHAM, DIRECTOR, DIVISION OF BIOLOGY AND MEDICINE; DR. RUSSELL S. POOR, DIRECTOR, DIVISION OF NUCLEAR EDUCATION AND TRAINING; DR. PAUL C. AEBERSOLD, DIRECTOR, DIVISION OF ISOTOPES DEVELOPMENT; JOHN S. KELLY, DIRECTOR, DIVISION OF PEACEFUL NUCLEAR EXPLOSIVES; MYRON KRATZER, DEPUTY DIRECTOR, DIVISION OF INTERNATIONAL AFFAIRS; ARTHUR L. TACKMAN, DIRECTOR, DIVISION OF PERSONNEL; J. A. DERRY, DIRECTOR, DIVISION OF CONSTRUCTION; VICTOR CORSO, ASSISTANT CONTROLLER FOR BUDGETS; AND DONALD C. KULL, DEPUTY ASSISTANT CONTROLLER FOR BUDGETS

LETTER TO SENATOR HAYDEN AND AMENDMENTS

Senator HILL. The committee will come to order.

We will be happy to proceed.

Doctor, will you proceed in your own way, sir?

I will, at this point, put your letter to Senator Hayden under date of November 18 together with the amendments so that they appear at this point in the record.

(The documents referred to follow:)

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., November 18, 1963.

HON. CARL HAYDEN,
Chairman, Committee on Appropriations,
U.S. Senate.

DEAR SENATOR HAYDEN: The Appropriations Committee of the House of Representatives on November 15, 1963, reported H.R. 9140, a bill making appropriations for certain civil functions administered by the Department of Defense, certain agencies of the Department of the Interior, the Atomic Energy Commission * * * for the fiscal year ending June 30, 1964, and for other purposes.

As reported by the Appropriations Committee of the House of Representatives the bill makes certain reductions in the appropriations requested for the atomic energy program. We have made a careful review of the areas affected by the bill as reported and propose certain amendments thereto for consideration by your committee.

Transmitted herewith are 15 copies of the amendments proposed by the Atomic Energy Commission to H.R. 9140, together with the reasons therefor.

Sincerely yours,

GLENN T. SEABORG, *Chairman.*

PROPOSED AMENDMENTS TO THE PUBLIC WORKS APPROPRIATION BILL, 1964—
ATOMIC ENERGY COMMISSION

(H.R. 9140)

(As reported by the House Committee on Appropriations)

Amended estimate submitted to the House:	
Operating expenses.....	\$2, 423, 500, 000
Plant and capital equipment.....	426, 145, 000
Total.....	<u>2, 849, 645, 000</u>
Bill as reported by the House Committee on Appropriations:	
Operating expenses.....	2, 308, 169, 000
Plant and capital equipment.....	380, 000, 000
Total.....	<u>2, 688, 169, 000</u>
Change by House Appropriations Committee:	
Operating expenses.....	-115, 331, 000
Plant and capital equipment.....	-46, 145, 000
Total.....	<u>-161, 476, 000</u>

PROPOSED AMENDMENTS TO THE BILL

(1) Page 22, line 2, strike out "\$2,308,169,000" and insert in lieu thereof "\$2,399,224,000."

(2) Page 23, line 14, strike out "\$380,000,000" and insert in lieu thereof "\$426,145,000."

H. REPT. 902.—PUBLIC WORKS APPROPRIATION BILL, 1964—ATOMIC ENERGY COMMISSION

<i>Operating expenses</i>	
Appropriation, 1963.....	\$2, 872, 224, 000
Estimate, 1964.....	2, 423, 500, 000
Recommended, 1964.....	2, 308, 169, 000
Comparisons:	
Appropriation, 1963.....	-564, 055, 000
Estimate, 1964.....	-115, 331, 000

Funds provided under this heading are distributed as shown in the following table:

Program	Budget estimate	Amount recommended	Reduction
Raw materials.....	\$324,843,000	\$320,000,000	-\$4,843,000
Special nuclear materials.....	480,471,000	475,000,000	-5,471,000
Weapons.....	782,969,000	782,969,000	-----
Reactor development.....	530,548,000	497,000,000	-33,548,000
Physical research.....	219,077,000	192,137,000	-26,940,000
Biology and medicine.....	76,973,000	68,645,000	-8,328,000
Training, education, and information.....	17,194,000	14,350,000	-2,844,000
Isotopes development program.....	9,260,000	7,860,000	-1,400,000
Civilian applications of nuclear explosives.....	15,100,000	10,000,000	-5,100,000
Community program.....	10,081,000	10,081,000	-----
Program direction and administration.....	73,415,000	71,560,000	-1,855,000
Security investigation program.....	6,950,000	6,950,000	-----
Cost of work for others.....	6,240,000	6,240,000	-----
Change in selected resources.....	53,252,000	28,250,000	-25,002,000
Revenues and reimbursements from non-Federal sources.....	-32,000,000	-32,000,000	-----
Unobligated balance brought forward.....	-150,875,000	-150,875,000	-----
Total.....	2,423,500,000	2,308,169,000	-115,331,000

REDUCTIONS AND OTHER ACTIONS

Raw materials.—The reduction of \$4,843,000 which the committee recommends in this program is based on recent years' experience which shows considerable underruns in costs as compared with the estimates submitted in the budget presentation. These underruns were \$24 million in 1962 and \$18,400,000 in 1963. The committee is confident that it can reasonably anticipate there will be an underrun of at least the amount of the reduction which has been made in the fiscal year 1964 estimate.

Special nuclear materials.—The reduction of \$5,471,000 in this program is based on the same type of underrun experience as in the previous program. The underruns here have varied from \$7 to \$40 million in the last 4 years.

Reactor development.—The reduction of \$33,548,000 which the committee has made in this program includes elimination of about half of the increase requested over the 1963 fiscal level. This reduction is based on 6-month availability of the 1964 appropriation. In addition, \$3 million budgeted for research and development and design assistance to utilities which may wish to construct power reactors has been deleted. It is the committee's opinion that continuation of this subsidy program is no longer necessary to stimulate the construction of power reactors since it has been demonstrated that they are now producing electric power at competitive costs at least in those areas of high conventional fuel costs.

Of the funds available an additional \$3.5 million is to be applied to the development work on the "seed and blanket" reactor concept.

Physical research.—In applying the reduction of \$26,940,000 to this program, the committee has specifically eliminated funds requested for the new "basic nuclear engineering" activity and has eliminated increases requested for all other programs except high energy physics. In addition, \$3,750,000 of the total reduction is to be applied to the controlled thermonuclear research program. The committee indicated last year that it expected that the number of concepts in this program would be reduced. Nothing was done about it. It is expected that this reduction will achieve the objective which the committee adopted in its action on the 1963 appropriation bill.

The committee's reaction to increases in this program continues to be as expressed in the report on the bill last year, and it reiterates the admonition that there be a tightening up in the process of selecting areas and subjects of research undertakings with greater emphasis on the overall usefulness of the potential results.

Biology and medicine.—The committee's reaction to this program is somewhat similar to that of the physical research program. The reduction of \$8,328,000 will hold this activity at the 1963 funding level.

Training, education, and information.—In applying the reduction of \$2,844,000 to this program, the committee specifically deleted \$70,000 for the Argonne School and \$75,000 for the Puerto Rico Nuclear Center. The total reduction holds this program to approximately the fiscal year 1963 level.

Isotopes development program.—The reduction of \$1,400,000 applied to this program represents about one-half of the increase requested and is based on the 6-month fund availability.

Civilian applications of nuclear explosives.—The reduction applied to this program holds the appropriation to approximately the 1963 funding level. It is the committee's understanding that delays in the program can be anticipated as a result of certain provisions of the test ban agreement. Further, it sees no need to speed up this peaceful use program to the level indicated by the budget.

Program direction and administration.—The reduction of \$1,855,000 which the committee has applied to this item includes the elimination of 73 of the 148 new jobs programed for a total of approximately \$730,000; elimination of approximately two-thirds of the travel increase requested, amounting to \$200,000; and elimination of approximately one-half of the contractual services increase, amounting to \$625,000. The remaining reduction of \$300,000 should be readily absorbed since the higher level of funding will be available for only about 6 months of the fiscal year.

Change in selected resources.—This reduction of \$25,002,000 which the committee has made in this program includes \$13,002,000 which is approximately one-half of the increases proposed for research and development contracts. This reduction is in line with the reduction that the committee has made in the research programs. The remaining \$12 million of the reduction eliminates obligations planned for the research and development and design assistance program in the civilian power reactor program. This reduction comports with the \$3 million reduction in costs made by the committee in the reactor development program previously discussed.

Plant and capital equipment

Appropriation, 1963.....	\$262,745,000
Estimate, 1964.....	426,145,000
Recommended, 1964.....	380,000,000
Comparisons:	
Appropriation, 1963.....	117,255,000
Estimate, 1964.....	—46,145,000

The reduction applied by the committee includes \$17,945,000 budgeted for plant and capital equipment projects not yet authorized, \$250,000 programed for the Puerto Rico Training Center, and \$27,950,000 slippage. This latter figure represents only one-fifth of the remaining increase requested over the fiscal year 1963, and should be easily absorbed since funds will be available only for about a 6-month period. Included in it is \$750,000 programed for a community building at Los Alamos. The committee would be glad to consider funding of such a building, but it is convinced that an adequate facility can be provided at a lower cost.

Amendment (1): Increase of \$91,055,000 in the appropriation for operating expenses

The Commission requests restoration of \$91,055,000 of the reduction made by the House Appropriations Committee. The following table summarizes the reductions made by the House Appropriations Committee and the requested restoration.

Summary of operating expenses

	AEC request	House Appropriations Committee change	Restoration requested
Raw materials.....	\$324,843,000	—\$4,843,000	-----
Special nuclear materials.....	480,471,000	—5,471,000	-----
Weapons.....	782,969,000		-----
Reactor development.....	530,548,000	—33,548,000	\$28,500,000
Physical research.....	219,077,000	—26,940,000	24,000,000
Biology and medicine.....	76,973,000	—8,328,000	7,000,000
Training, education, and information.....	17,194,000	—2,844,000	2,400,000
Isotopes development program.....	9,260,000	—1,400,000	700,000
Civilian applications of nuclear explosives.....	15,100,000	—5,100,000	4,100,000
Community program.....	10,081,000		-----
Program direction and administration.....	73,415,000	—1,855,000	1,355,000
Security investigation program.....	6,950,000		-----
Cost of work for others.....	6,240,000		-----
Change in selected resources.....	53,252,000	—25,002,000	23,000,000
Revenues and reimbursements from non-Federal sources.....	—32,000,000		-----
Unobligated balance brought forward.....	—150,873,000		-----
Total.....	2,423,500,000	—115,331,000	91,055,000

The reasons for the requested restoration are given below:

Raw materials

The House committee reduction of \$4,843,000 was based on House committee anticipation of underruns in line with recent years' experience. This reduction is not being appealed. Negotiations for the stretchout of deliveries under existing raw materials procurement contracts are now underway. Until further progress is made on these negotiations, it is not possible to say with a high degree of certainty what the raw material deliveries during 1964 will be. If subsequent developments indicate 1964 requirements in excess of the \$320 million program total recommended by the House committee, it would be necessary to provide for the increase by making reductions elsewhere within the total appropriation.

Special nuclear materials

In view of favorable cost experience subsequent to development of the 1964 estimates, the House committee reduction of \$5,471,000 is not being appealed.

Reactor development

The House committee bill reduced by \$33,548,000 the amount of \$530,548,000 requested for 1964. The committee eliminated about half of the increase requested over the 1963 level and indicated that this reduction was based on 6-month availability of the 1964 appropriation. The committee made a specific deletion of \$3 million budgeted for research and development and design assistance to utilities which may wish to construct power reactors (in addition the committee deleted \$12 million in obligations for this purpose under the "Change in selected resources" category). The committee expressed the opinion that continuation of this program is no longer necessary to stimulate the construction of power reactors since it has been demonstrated that they are now producing electric power at competitive costs, at least in those areas of high conventional power costs. The committee report states further that, of the funds available, an additional \$3,500,000 is to be applied to the development work on the "seed and blanket" reactor concept.

Of the House committee reduction of \$33,548,000, the Commission is requesting restoration of \$25 million and is also requesting Senate approval of the \$3,500,000 added by the House committee for development work on the seed and blanket reactor concept, for a total increase of \$28,500,000.

The Commission requests restoration of the \$3 million reduction in operating costs (and the \$12 million reduction in obligations under "Changes in selected resources") for research and development and design assistance to utilities planning to construct power reactors. Although nuclear powerplants now being planned for construction have projected power generating costs competitive with conventional plants in areas of high fossil fuel costs, the economics have not yet been demonstrated. The financial risks of the utilities undertaking such nuclear powerplant projects, particularly in the area of nuclear power cycle economics, are significant and the relatively small amount of assistance that would be provided by AEC is considered necessary to spur the utilities in their endeavors. It is recognized that the technology for light water reactors has reached the point in development where further Government support may not be necessary. The \$15 million requested for this program, however, was not intended for light water reactors. These funds would be used to enter into cooperative arrangements with manufacturers and utilities under proposals for construction by the utilities of more advanced reactors, for example, the high-temperature gas-cooled reactors and the sodium graphite reactors. By entering into such arrangements, it may be possible to avoid the need for direct Government construction of prototype reactors of some advanced types. This would make possible the accomplishment of civilian cooperative power reactor demonstration program objectives with a minimum investment of Government funds in physical facilities and with maximum participation by industry in the developmental phases of the program.

In arriving at the budget request for fiscal year 1964, consideration has been given to programs initiated in the latter part of fiscal year 1963 and to the requirements for programs, including those being carried out cooperatively with other agencies, which are proceeding against a planned schedule of accomplishment. For these latter programs a delay in attainment of objectives may involve a disproportionately large increase in future years' costs and a probable increase in overall program costs.

The following are examples of activities for which increased costs will be necessary in 1964. It should be noted that some of these activities are not scheduled to start or to increase in scope until the latter half of the fiscal year.

(1) Initiation of new cooperative power reactor demonstration projects in fiscal year 1964 with the city of Los Angeles, Connecticut Yankee Atomic Power Co., and Southern California Edison Co., under prior year authorization (\$6.2 million).

(2) Initiation by AEC of SNAP 50 power conversion system development in fiscal year 1964. This development, which was previously undertaken by the Air Force, was assigned to the AEC under the interagency agreement between the Air Force, NASA, and AEC (\$4 million).

(3) The purchase in the last half of fiscal year 1964 of two BLUE SCOUT launch vehicles required for the aerospace safety testing program on nuclear generators and reactors being developed for use in space (\$2 million).

(4) Initiation of a new contract to develop a strontium 90 fueled generator for use in space. A contractor should be selected by midyear, with costs to be incurred in the latter part of the year (\$0.8 million).

(5) Development of strontium 90 fueled generators for the Navy Department. Plans are to select and negotiate a contract in the first half of the year with development costs to be incurred in the latter half (\$0.4 million).

(6) Fabrication of the ultra-high-temperature reactor experiment (UHTREX) at Los Alamos, which was started late in fiscal year 1963, is expected to increase in fiscal year 1964 with completion scheduled in fiscal year 1965 (\$1 million).

(7) Procurement and fabrication of experimental equipment for the loss of flow test (LOFT) facility at the National Reactor Testing Station, Idaho. Plans are to initiate experiment procurement and fabrication in the latter half of fiscal year 1964 (\$1 million).

(8) Higher level of research and development on an advanced high-temperature gas reactor experiment, in accordance with an orderly accomplishment of the program (\$1.5 million).

(9) Increased fabrication on experimental reactors and fuel elements for the rocket propulsion program (Project ROVER). Several reactor and fuel element sets were started in fiscal year 1963 and are to be completed in fiscal year 1964 (\$6.6 million).

(10) Increased level of rocket propulsion reactor testing at the Nuclear Rocket Development Station in Nevada. It was assumed that three hot tests and two cold flow tests would be conducted in fiscal year 1964. The cold flow tests have been underway for some time with the hot tests to be run in the latter part of the fiscal year (\$7 million).

(11) Increased level of development on the SNAP-8 reactor. This is a joint AEC-NASA development program based on a schedule which would culminate in the integration of the nuclear reactor and the power conversion system and test of the complete electric generating system. The schedule assumed a gradual increase in fiscal year 1964 (\$2.2 million).

Physical research

The \$192,137,000 which the House Appropriations Committee recommended represents a reduction of \$26,940,000 from the \$219,077,000 requested for the physical research program in fiscal year 1964. The committee directed in its report that the proposed new program in basic nuclear engineering not be initiated and that no increase be allowed for programs other than high energy physics. The committee made a reduction of \$3,750,000 in the controlled thermonuclear program, and specifically referred to a reduction in the number of concepts being pursued. The report also reiterated the committee's position contained in its report of last year that there should be a tightening up in the process of selecting areas and subjects for research undertakings with greater emphasis on the usefulness of potential results.

Restoration of \$24 million of the reduction is requested. The activities in the physical research program are oriented toward a fundamental understanding of the scientific fields underlying the atomic energy program. Hence, by definition, basic research is not directly a utilitarian thing. The end product of its activities is knowledge. The ultimate objective, then, is the reduction of many different phenomena to a simple set of principles through which known facts are understood and from which new principles may be predicted. It is from this expanding reservoir of knowledge that developmental and engineering accomplishments in the more applied areas of the atomic energy program are achieved.

The restriction of the programs in low-energy physics, mathematics and computers, chemistry, and metallurgy to fiscal year 1963 levels is severely restrictive in view of the impending operation of major research tools such as the Ames research reactor, the Brookhaven high-flux beam reactor, the Oak Ridge high-flux isotope reactor, the LRL (Berkeley) 88-inch cyclotron, accelerators located at the

University of Texas, University of Washington, and the new machines under procurement for the University of Minnesota and Yale University, and the variable energy cyclotrons of the University of Michigan and California (Davis). These tools represent a sizable investment. It would be impossible to use these devices effectively under the House committee action.

In addition, the chemistry program has necessary commitments above the 1963 level for the transplutonium production program and for special projects so that the remainder of the program would have to be reduced below established levels of effort. Furthermore, plans for programs in metallurgy and materials would be severely curtailed. The effect of this on important programs on radiation damage would be to hold them at relatively low levels; delay the expansion of important work on the basic metallurgy of plutonium, superconductivity and pure materials after recent initiation; and fail to meet the AEC obligations with respect to the national program of interdisciplinary laboratories. Much of this work will not only make important contributions to the science of materials but is inextricably involved with the programs central to so many of the major roadblocks besetting AEC and other programs throughout the country. Freezing at the fiscal year 1963 level in mathematics and computer research represents a sizable reduction in going programs and would adversely affect AEC's ability to maintain a vigorous and balanced research program in the physical sciences.

The program of basic nuclear engineering proposed for initiation in fiscal year 1964 will provide a fundamental understanding of various phenomena of importance to the development, design, and operation of nuclear systems. Comparatively small investments in long-term development of basic understanding in such fields (e.g., heat transfer, fluid dynamics, and mass transfer) will minimize in the future, the empirical approach to engineering and design of nuclear systems, an approach which, due to uncertainties and lack of optimization inherent in it, contributes significantly to increasing the cost of developing and operating the systems. Complete elimination of this activity would prevent conduct of necessary projects under any overall budgetary limitation, and close off an area of practical benefit from rather basic research.

While the House committee action on the high-energy physics program has not been as restrictive, it will require a significant revision in the program. The principal impact on the high-energy physics program will be a retardation in the effective exploitation of AEC's major high-energy particle accelerators, a concomitant loss in buildup of university machine-user programs and an uneconomic stretchout of the major design study programs directed toward the next generation of high-energy machines. In addition, preoperational buildup in preparation for use of the Stanford linear accelerator would be adversely affected.

The reduction proposed for the controlled thermonuclear program would require drastic cutbacks at major AEC laboratories in order to reduce expenditures by \$3,750,000 in the months remaining in fiscal year 1964. As presently constituted, Project Sherwood is an integrated body of research designed to determine the feasibility of producing controlled fusion power. The major experiments in this field are mutually dependent; repeatedly, results from different laboratories lead to devices incorporating the best features of all the experiments involved. However, for reasons of convenience of program presentation major experiments are usually described as approaches to the above objective.

It has been suggested that AEC should eliminate the least promising concept. Acceptance of a cut of the magnitude proposed, at this time, involves premature abandonment of more than one approach. The Commission is mindful of the desirability of reducing the number of concepts being pursued, and has every intention of doing so when it becomes apparent that one or more of the approaches can be abandoned. As indicated below, it appears very unwise to eliminate any approach at this time.

Firstly, it might bring the United States down to a secondary national position in the worldwide effort. At present the United States is in a leading position although the U.S. manpower devoted to controlled fusion is relatively small. (Scientists and engineers supported on AEC funds number about 315, and in addition 60 are supported by U.S. industries making a total of 375. On the other hand, the present free world effort outside the United States is manned by about 680 scientists and engineers, while the U.S.S.R. has about 600.)

Secondly, forward momentum is lost. It is practically certain that continuation of this severe cut would lead to the progressive demise of the U.S. program, at a time when other nations are increasing their activities.

The fusion programs everywhere are moving forward rapidly to improved confinement of the very hot plasmas. Recent striking results by Joffe in the

U.S.S.R. on mirror confinement of hot plasmas have led to extensive work on still better means of confinement. The new configurations are called Minimum-B fields. Several AEC laboratories have begun preliminary experiments on Minimum-B concepts which are believed to be far more promising than that developed in Russia. It would therefore be a serious mistake to decrease effort on controlled fusion to which the foreign nations, especially the U.S.S.R., accord a very high priority—just at a time when the Sherwood program is making rapid progress utilizing the most powerful body of hot plasma equipment existing in the world.

With respect to the stellarator approach, it seems unreasonable to stop work in this field, comprising a cumulative investment of about \$65 million in facilities and research to test the concept, when the model C stellarator is approaching critical tests of its ability to confine extremely hot plasmas.

A mirror machine confining a hot plasma at a density expected to be used in practical fusion power reactor has been studied with great success. Abandonment of this approach at the advent of the Minimum B development, would leave this country in the position of a bystander in a very promising major part of worldwide fusion power research.

Recently the density of plasma in DCX-2 has been increased by a factor of about 100, far in advance of those obtained by the principal competitors in Moscow. Preliminary experiments utilizing new measures for increasing the confinement time of plasma have been very successful. Abandonment of the DCX approach can scarcely be considered in the light of these facts.

The Astron device has recently been completed after 7 years of work and at a cost of about \$10 million. It is now under initial test operation. Abandonment at a time when it is about to undergo critical test and evaluation is considered unreasonable.

Work on pinch, magnetic shock compression and rotating plasma approaches provides results on fusing plasmas which should be applicable to a wide variety of future practical fusion power reactors, because it supplies means for getting detailed knowledge of neutron production, and particle loss, while the nuclear fusion reactions are taking place. If this work were eliminated the U.S. program would lose fundamental information which will be required in all of the other approaches. This approach is the only Sherwood work carried on at Los Alamos.

Biology and medicine

The House committee bill would reduce by \$8,328,000 the amount of \$76,973,000 requested for the biology and medicine program in fiscal year 1964. The House Appropriations Committee in its report indicated that its reaction to this program is somewhat similar to that for the physical research program; namely, that there should be a tightening up of the process of selecting areas and subjects for research undertaken, with greater emphasis on the overall usefulness of the potential results. The committee's report also indicated that the reduction of \$8,328,000 will hold this activity to the 1963 funding level.

Restoration of \$7 million to a revised total of \$75,645,000 for this program is urged. The restoration requested will provide for those funds essential to continuation of planned programs, including occupancy of new facilities; necessary expansion in specialized areas, such as the new program at Lawrence Radiation Laboratory, Livermore, to investigate all aspects of the sequence of events following the release of radiation or radioactivity to the biosphere from various nuclear energy activities, somatic and genetic effects of radiation at the molecular level as well as the whole plant or animal, and stratospheric radioactivity studies; and fulfillment of agreed-upon commitments, such as in research in oceanography and wholesomeness and nutritious effects of radiation pasteurization of foods. The restoration requested will allow initiation of little or no new research work.

AEC is recognized as having major responsibility for developing the basic information concerning the effects of radiation on man and his environment. These data are required for the practical employment of nuclear energy by man now and in the future. The budget requested for this program has been developed to fulfill these responsibilities.

With regard to the process of selecting areas and subjects for research undertakings, the Commission has continually been mindful of the need for demonstration of the usefulness of the research, as evidenced by the pruning out of projects representing an annual cost level of more than \$2 million during the past year. The Commission conducts a continual review of activities for productivity and timeliness.

Training, education, and information

The House committee bill would reduce the training, education, and information program by \$2,844,000, to about the 1963 level. This includes specific deletions of \$70,000 for the Argonne School and \$75,000 for the Puerto Rico Nuclear Center. Of the total reduction it is requested that \$2,400,000 be restored.

The 1964 estimate includes \$1,210,000 for preparatory work leading to U.S. participation in the Third Geneva Conference on the Peaceful Uses of Atomic Energy scheduled for the fall of 1964. This is a special item for which no costs were incurred in fiscal year 1963. The U.S. commitment to participate in this Conference has been assigned by the Department of State to AEC for scientific preparation and representation. A comprehensive conference of this type is valuable because of the constantly increasing range of the peaceful uses of nuclear energy and is important to future economic development on an international scale. This Conference would enhance the scientific image of the United States abroad. It would also provide the means for a fruitful exchange of knowledge and ideas among specialists from many nations in numerous scientific and technical disciplines.

The reduction of \$75,000 for the operation of the Puerto Rico Nuclear Center, if applied, would result in a reduction in staff and operating level of the Center below the fiscal year 1963 level and the minimum necessary to maintain the effectiveness of curriculums and associated research work. Retention of this reduction would, therefore, require operation of this important educational and research facility below the fiscal year 1963 level and have an adverse effect upon the breadth, vitality, and scientific stature of the staff and associated research programs. The Commission therefore believes that the amount of \$1,175,000 requested for the Center is not excessive and that the amount reduced by the House should be restored.

It now appears that it may be possible to carry out the planned training program at the Argonne School within the reduced amount allowed by the House committee. Restoration of this \$70,000 cut is not requested.

In addition to the above special items, the Commission requests restoration of \$1,115,000 for the remaining activities in the training, education, and information program. This represents about 75 percent of the House committee reduction. Adherence to the reduced program level recommended by the House committee would reduce technical information activities below the 1963 level and would seriously cripple AEC's efforts to provide scientists, engineers, and the public with the results of research and technology developed in the atomic energy program. The volume of informational data processed is growing steadily and the annual increase has been more than 8 percent. Additional funds are necessary to cover minimum requirements for information tools and services such as books, technical progress reviews, scientific exhibits, and the science information exchange. Of the 1964 estimate about \$160,000 is necessary to cover the additional costs associated with the Federal Employee Salary Act of 1962 for personnel of the Document Information Center at Oak Ridge.

The House committee reduction would also have a serious effect on training and education in the physical and life sciences and engineering. The reduction would result in a serious retrenchment in planned courses to train scientists and engineers in the safe handling of radioactive materials; to bring radioisotopic instruction to the campuses of small colleges which usually cannot spare faculty for off-campus training; and to qualify physicians for AEC license to use radioactive materials in the diagnosis and treatment of disease, especially cancer and radiation injuries. The reduction would also necessitate delay in satisfying the long-standing need for specialized research training of post doctoral fellows possessing unusual investigative ability in the radiation aspects of the life and physical sciences and on-the-job applied health physics training at cooperating AEC installations. It would also be necessary to reduce the level of faculty training institutes in radiobiology for high school and college teachers of science; this would result in eliminating at least 170 teachers from this program.

If the House committee reduction were made, other portions of the training, education, and information program would also be hampered. These include training assistance to States or local governments in radiation control where States are undertaking certain regulatory functions and the program for public dissemination of important information pertaining to the atomic energy program.

Isotopes development

The House committee bill would reduce by \$1,400,000 the amount of \$9,260,000 requested for the isotopes development program in fiscal year 1964. The House Appropriations Committee in its report indicated that this reduction represents

about one-half of the increase requested and is based on the 6-month fund availability.

Restoration of \$700,000 of the reduction is requested, largely for the isotopic power and heat sources development category, which is essential to SNAP (systems for nuclear auxiliary power) generator development, provision of isotopic fuel for DOD and NASA missions, and other Government requirements. Specifically, the curium 242 program will require the purchase of large quantities of the Americium target material in the second half of fiscal year 1964, as well as costs for reactor irradiation of the targets and fabrication of the curium into final sources.

The planned schedule for the radiation pasteurization of foods program also involves increased costs in the latter half of fiscal year 1964, consistent with the previously agreed upon program level, as required for the irradiation of larger quantities of food needed for extensive studies.

Civilian applications of nuclear explosives

A \$5,100,000 reduction, from \$15,100,000 to \$10 million, was made in funds requested for the Plowshare program to hold the program to the fiscal year 1963 level because the House committee did not see the need to increase the program and because of its understanding that delays in the program could be anticipated as a result of the treaty banning nuclear weapon tests. However, the treaty does not prohibit Plowshare tests. Its relation to Plowshare is simply that it prohibits any nuclear explosion which would cause radioactive debris to be present outside national boundaries. Thus, the treaty really limits only that part of the program in the fiscal year 1964 budget which contemplated large-scale cratering experiments which might have caused radioactive debris to be present outside U.S. boundaries.

Since completion of negotiations on the treaty in late July, the program has been thoroughly reviewed. It has recently been concluded that it is necessary to increase tests to develop cleaner nuclear explosives and to carry out small scale excavation experiments to advance the technology in the near future in lieu of the large scale experiments. Research and development and experiments in scientific and other engineering applications will continue. This revised program can proceed under the terms of the treaty and important progress can be made. Furthermore, such a program is necessary to and consistent with the administration's assurances to the Senate and with the basis for the Senate's advice and consent to the treaty.

In order to carry out this revised program, \$4,100,000 of the \$5,100,000 reduction should be restored, for a program total of \$14,100,000. At any level less than this it would be necessary to eliminate important tests or experiments or to reduce ongoing research effort.

Program direction and administration

The House committee bill would eliminate 73 of the 148 additional positions requested and reduce program direction and administration costs by \$1,855,000. Restoration is requested for the 73 positions and for \$1,355,000 of the reduction.

The reduction of positions as recommended by the House will severely curtail AEC's ability to give technical direction and administrative support to the new and expanded research and development activities, and would cause concern whether the responsibility for management of existing programs can be fully met. Actions taken in this and the past fiscal year to strengthen the organization for direction and control of research and development projects have increased the need for technical positions. The requirements for the 148 additional positions included in the fiscal year 1964 budget request have not diminished in total since the budget was submitted, and are not reduced by the fact that part of the fiscal year has elapsed.

Current and increased needs of the SNAP, ROVER, and other reactor development activities comprise a substantial portion (95) of the total number of positions requested. The research programs are currently short of positions required for adequate program management and will require the full number of 25 positions requested. Ten positions were requested for support of test operations and the Plowshare program. In addition, 18 positions are needed to meet critical needs of the regulatory program.

When the construction budget was amended and operating funds reprogrammed to provide for the safeguards program pursuant to the nuclear test ban treaty, no request was made for additions to the AEC staff, although this will have a significant effect on workload. This makes it even more important that the full staffing plan for 1964 be approved.

AEC employment for program direction and administration is about 4 percent of contractor employment, while costs of program direction and administration are about 2 percent of total operating and construction costs. At this time when AEC staffing for direction and administration of the growing research and development programs is spread thin, a relative loss or gain in AEC positions can have an impact on the effectiveness or economy of contractor operations which is far greater than the cost of the positions.

Restoration of funds is requested for the new positions and for reductions made in the contractual services estimates. The estimate for contractual services is deemed the minimum necessary to support the staff requested under this program and to cover certain fixed charges such as communications, supplies and materials, janitorial services, machine rentals, etc. The increase requested in fiscal year 1964 is related to the higher level of employment; additional contractual requirements for the Nevada-SNPO complex; annualization of communications services; postal services and machine rentals; full-year's operation at the Bethesda location; and for increased charges from other Government agencies resulting from the pay increase act of 1962.

Restoration is not being requested for the reduction of \$200,000 in travel or the general reduction of \$300,000 made by the House based on delay in appropriation action in view of operating on a restricted basis during the first part of the fiscal year.

Changes in selected resources

The House committee reduction of \$25,002,000 includes \$12 million for the cooperative power reactor demonstration program and \$13,002,000 related to committee reductions in estimated costs for the research and development programs. Restoration of \$23 million is requested.

As discussed above under the reactor development program, the \$12 million in obligations under this category and the associated \$3 million in reactor development program costs for research and development and design assistance to utilities can make an effective contribution toward effective and economical accomplishment of AEC's cooperative power reactor demonstration program objectives. The reduction should be restored.

The remaining \$11 million for which restoration is requested is related to the requested restoration in program cost estimates.

Amendment (2): Increase of \$46,145,000 in the appropriation for plant and capital equipment

The Commission requests restoration of the entire \$46,145,000 reduction made by the House Appropriations Committee. The following table summarizes the reductions made by the House Appropriations Committee and the requested restoration.

Summary of plant and capital equipment

	AEC request	House Appropriations Committee change	Restoration requested
Weapons construction projects not yet authorized.....	\$17,945,000	-\$17,945,000	\$17,945,000
General plant projects for Puerto Rico Nuclear Center.....	250,000	-250,000	250,000
Community building portion of Los Alamos community disposal project.....	750,000	-750,000	750,000
All other.....	407,200,000	-27,200,000	27,200,000
Total.....	426,145,000	-46,145,000	46,145,000

The reasons for the requested restoration are given below:

Weapons construction projects

In October the AEC 1964 budget was amended to provide for 12 additional weapons program construction projects at a total estimated cost of \$17,945,000, which are a necessary part of the safeguards program being undertaken as a result of a recently approved test ban treaty. The Commission discussed these requirements with the House Appropriations Committee on October 23. The House committee elimination of this \$17,945,000 requirement was based on the fact that authorization action on these projects had not yet been completed. The Joint Committee on Atomic Energy held hearings on these projects on October 31 and it is expected that an authorization act will be passed in the near future.

Accordingly, it is recommended that the entire \$17,945,000 be included in the AEC appropriation for 1964.

The 12 new construction projects are an important part of the commitment to maintain modern nuclear laboratory facilities and programs which will attract, retain, and insure the continued application of human resources which are vital to an effective weapons program. Five projects estimated to cost \$8,755,000 are proposed for the Lawrence Radiation Laboratory at Livermore, Calif. These include a radio-chemistry building, plant engineering and services building, and additions to the craft shop, the cafeteria, and the hazards control building. At the Los Alamos Scientific Laboratory in New Mexico there would be three new construction projects estimated to cost \$3,740,000. These facilities would provide space for the operational health physics group and would replace inadequate high temperature chemistry laboratory space and plutonium research space. At Sandia Base, N. Mex., \$4,820,000 is required for three construction projects, an explosives chemistry laboratory, a development laboratory, and additions to the classified technical reports building. In keeping with the intensive underground testing activities at the Nevada test site, it is necessary to build an addition to the control point facilities at an estimated cost of \$630,000.

General plant projects at Puerto Rico Nuclear Center

The House Appropriations Committee has recommended elimination of all general plant project funds for the Puerto Rico Nuclear Center in the amount of \$250,000. Such action would prevent the construction of urgently needed shop facilities, the conversion of present space in the PRNC building at Mayaguez to additional classroom and laboratory space, and the construction of a low level counting facility to be used in conjunction with work currently being conducted with the reactor.

This \$250,000 general plant project item is the only construction project proposed for the Puerto Rico Nuclear Center in 1964. Some funds of this nature are essential for any operating installation. It is particularly important here because the growth of interest in the programs of the Puerto Rico Nuclear Center has caused serious overcrowding throughout most of the complex. Restoration of the entire amount is very important to the continued effectiveness of the Center.

Community building at Los Alamos

The House Appropriations Committee eliminated \$750,000 for a community building at Los Alamos. The committee did not question the need for such a building but indicated its feeling that an adequate facility could be provided at a lower cost.

The proposed community building at Los Alamos is a part of the community disposal construction authorized in the 1962 amendment to the Atomic Energy Community Act of 1955. The need for this building and the cost estimate of \$750,000 have been given a very careful review. The new county building as presented in the budget represents standard facilities necessary to allow the performance of the various functions soon to be turned over to county management. These functions include among others, municipal management as well as county management, court, police, zoning, taxation, recreation, and utilities for an area comprising 27.3 square miles including the towns of Los Alamos and White Rock, N. Mex. The proposed building provides not only for normal office space and a records area, but also for specialized court areas; i.e., hearing room, chambers, etc. Space currently in use is a temporary World War II barracks quarters which cannot be efficiently nor economically converted to support these functions.

Facilities similar in function to that proposed at Los Alamos were provided at Oak Ridge, Tenn., and Richland, Wash., when Government ownership and management of those communities was terminated under the same basic legislation now being implemented at Los Alamos. The building at Richland cost about \$650,000 in 1956. The one at Oak Ridge cost slightly under \$500,000 in 1956.

While these buildings were somewhat smaller in size than that presently proposed for Los Alamos, Oak Ridge, and Richland only provided space for municipal functions. As stated, the building at Los Alamos requires space for county as well as municipal activities. The size of the proposed building has been scaled to the minimum space necessary to support the wider range activities associated with running both the county operation and municipal functions.

Further, the higher cost proposed for the Los Alamos facility in comparison with the Oak Ridge and Richland facilities should be viewed in light of construction cost index increases since 1956 and the price differences in locations. Comparative costs considering these factors would be:

Los Alamos.....	\$750, 000
Oak Ridge.....	790, 000
Richland.....	720, 000

All other

Except for the items discussed above, the House Appropriations Committee made no suggestions for elimination of specific items in the plant and capital equipment appropriation but suggested that a reduction of \$27,200,000 could be made because of program slippage associated with the fact that 1964 funds will be available only for about a 6-month period. While it is true it has not been possible to start construction of new 1964 projects prior to enactment of an appropriation, a considerable amount of advance planning work has been done. Accordingly, it is expected that the awarding of construction contracts can begin promptly upon passage of the 1964 appropriation act. In order to proceed with the construction projects in an orderly fashion and to avoid costly construction delays, it is important that full funding for the authorized construction projects be available in 1964. Accordingly, restoration of the entire reduction is requested.

[H. Doc. 105, 88th Cong., 1st sess.]

COMMUNICATION FROM THE PRESIDENT OF THE UNITED STATES, TRANSMITTING AMENDMENTS TO THE BUDGET FOR THE FISCAL YEAR 1964 IN THE AMOUNT OF \$14,607,500 FOR THE LEGISLATIVE BRANCH AND A DECREASE OF \$49,300,000 FOR THE ATOMIC ENERGY COMMISSION

THE WHITE HOUSE,
Washington, April 22, 1963.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith for the consideration of the Congress amendments to the budget for the fiscal year 1964 in the amount of \$14,607,500 for the legislative branch and a decrease of \$49,300,000 for the Atomic Energy Commission.

The details of these amendments, the necessity therefor, and the reasons for their submission at this time are set forth in the attached letter from the Director of the Bureau of the Budget with whose comments and observations thereon I concur.

Respectfully yours,

JOHN F. KENNEDY.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., April 20, 1963.

THE PRESIDENT,
The White House.

SIR: I have the honor to submit herewith for your consideration amendments to the budget for the fiscal year 1964 in the amount of \$14,607,500 for the legislative branch and a decrease of \$49,300,000 for the Atomic Energy Commission, as follows:

As provided by statute, these amendments to the 1964 budget for the legislative branch are submitted without change.

Atomic Energy Commission

Budget appendix page	Heading	Original estimate	Revised estimate	Decrease
689	Operating expense.....	\$2,472,800,000	\$2,423,500,000	\$49,300,000

The proposed reduction of \$49.3 million is made possible by savings expected during the fiscal years 1963 and 1964. The Commission's funds are available until expended; therefore, the 1963 savings can be applied to the 1964 requirements. The savings in both years stem from three sources: greater than anticipated success in the stretchout of deliveries of domestic uranium concentrates, improvements in the conduct of operations for producing special nuclear materials, and reductions in the unit costs of producing nuclear weapons.

I recommend that these amendments to the budget for the fiscal year 1964 be transmitted to the Congress.

Respectfully yours,

KERMIT GORDON,
Director, Bureau of the Budget.

[H. Doc. 166, 88th Cong., 1st sess.]

COMMUNICATION FROM THE PRESIDENT OF THE UNITED STATES, TRANSMITTING AN AMENDMENT TO THE BUDGET FOR THE FISCAL YEAR 1964 IN THE AMOUNT OF \$5,945,000 FOR THE ATOMIC ENERGY COMMISSION

THE WHITE HOUSE,
Washington, October 16, 1963.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith for the consideration of the Congress an amendment to the budget for the fiscal year 1964 in the amount of \$5,945,000 for the Atomic Energy Commission.

The details of this amendment, the necessity therefor, and the reason for its submission at this time are set forth in the attached letter from the Director of the Bureau of the Budget with whose comments and observations thereon I concur.

Respectfully yours,

JOHN F. KENNEDY.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., October 15, 1963.

THE PRESIDENT,
The White House.

SIR: I have the honor to submit herewith for your consideration an amendment to the budget for the fiscal year 1964 in the amount of \$5,945,000 for the Atomic Energy Commission.

The Atomic Energy Commission is undertaking a number of additional steps to implement the various safeguards referred to in your letter to Senators Mansfield and Dirksen of September 10, 1963, and Deputy Secretary of Defense Gilpatric's letter of August 23, 1963, to Senator Russell on the three-environment test ban treaty ratified by the Senate on September 24. These steps include intensification of underground testing, preparations to resume atmospheric testing if that should ever become necessary, and further improvement and expansion of facilities at the Commission's weapons laboratories. The addi-

tional steps being taken by the Atomic Energy Commission complement additional measures being taken by the Department of Defense.

Most of the Commission's program will be funded by savings in and reprogramming of available and budgeted funds. The portion of the program requiring further funds is described as follows:

Atomic Energy Commission

Budget appendix page	Heading	Original estimate	Revised estimate	Increase
693	Plant and capital equipment.....	\$420,200,000	\$426,145,000	\$5,945,000

The proposed increase of \$5,945,000 is needed to construct facilities, mainly at the Commission's three weapons laboratories, to improve further those laboratories as a part of the safeguards program referred to above. The amount requested, together with \$12 million available through reprogramming of budgeted funds, will provide for a special construction program at the laboratories in the amount of \$17,945,000. Authorizing legislation is being proposed to the Congress by the Atomic Energy Commission to cover these additional construction projects.

I recommend that this amendment to the budget for the fiscal year 1964 be transmitted to the Congress.

Respectfully yours,

KERMIT GORDON,
Director of the Bureau of the Budget.

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., October 24, 1963.

HON. CARL HAYDEN,
*Chairman, Committee on Appropriations,
U.S. Senate.*

DEAR SENATOR HAYDEN: By letter of October 16, 1963, the President transmitted a proposed amendment to the Atomic Energy Commission's fiscal year 1964 appropriation request to the Speaker of the House of Representatives. This amendment would increase the requested appropriation for plant and capital equipment for fiscal year 1964 by \$5,945,000, from \$420,200,000 to \$426,145,000. The increase of \$5,945,000 is the net result of adding 12 proposed new construction projects for the weapons laboratories at a total estimated cost of \$17,945,000 and a reduction of \$12 million previously proposed for construction of a military compact reactor which, while requested by the Commission, was not included in Public Law 88-72 authorizing fiscal year 1964 appropriations for AEC.

The additional projects are proposed in keeping with the safeguards program as set forth in the letter from the Director of the Bureau of the Budget to the President of October 15, 1963, which the President cited in transmitting the amendment.

These safeguards activities also result in an increase in the weapons operating budget for fiscal year 1964. Total weapons program costs would be increased by \$94,641,000, from \$688,328,000 to \$782,969,000. This increase is met, however, by downward revisions in the fiscal year 1964 estimates for certain other programs and by use of unobligated balances of fiscal year 1963 funds as now indicated by our yearend reports.

Attached are the revised estimates, descriptions of the proposed new construction projects, and a summary of the changes in operating estimates together with a brief explanation of these changes. The Bureau of the Budget concurs in these reprogramming actions. We will be prepared to provide additional informa-

tion and to discuss our current program plans when the appropriation hearings are held.

Sincerely yours,

GLENN T. SEABORG, *Chairman.*

PROPOSED AMENDMENT TO AEC, FISCAL YEAR 1964 BUDGET

Plant and capital equipment

12 new construction projects.....	\$17,945,000
Less military compact reactor.....	-12,000,000
Total amendment.....	5,945,000

Descriptions of the proposed new projects are given below.

64-d-10 Occupational health laboratory, Los Alamos Scientific Laboratory, New Mexico, \$1,650,000

This project provides for facilities designed to upgrade the research and development capabilities and the physical plant of the laboratory and to afford needed permanent laboratory and office space.

This building provides 26,500 gross square feet of laboratory, office, and related space to provide additional needed space for the weapons-supported industrial hygiene and radiation effects work groups and to relieve the crowded conditions in the biomedical laboratory.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 11 percent of construction costs.....			\$138,000
(b) Land and land rights.....			0
(c) Construction costs.....			1,294,000
Improvements to land.....		\$15,000	
Building (26,500 gross square feet).....	¹ \$35.50	940,955	
Utilities.....		10,000	
Equipment.....		328,045	
Fixed lab equipment.....	\$180,045		
Specialized lab equipment.....	110,000		
Furniture and special equipment.....	38,000		
(d) Contingencies, at 15 percent of other costs.....			218,000
Total project cost.....			1,650,000

¹ Breakdown of space by type and unit cost:

Laboratory, 11,988 square feet, at \$56.43.....	\$676,483
Office, 3,440 square feet, at \$22.....	75,680
Shop, 970 square feet, at \$28.....	27,160
Service, utility, storage, and corridor areas, 10,102 square feet, at \$16.....	161,632
Total (26,500 square feet).....	940,955

The average space unit cost is \$35.50.

64-d-11 High temperature chemistry facility, Los Alamos Scientific Laboratory, N. Mex., \$1,435,000

This project provides for facilities designed to upgrade the research and development capabilities and the physical plant of the Laboratory and to afford needed permanent Laboratory and office space.

This facility provides 23,000 gross square feet of laboratories, shops, offices, and related space to supplement an existing crowded laboratory facility that is inadequate for both present and anticipated programs and to replace an old, inadequate wooden structure.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 9 percent of construction costs.....			\$100,000
(b) Land and land rights.....			0
(c) Construction costs.....			1,145,000
Improvements to land.....		\$3,500	
Buildings (23,000 gross square feet).....	¹ \$31.70	729,600	
Utilities.....		5,000	
Removal cost (dismantling and removing 1 1-story frame building).....		12,500	
Equipment.....		394,400	
Fixed laboratory equipment.....	\$80,400		
Induction furnaces.....	80,000		
High pressure measurement system.....	55,000		
Other special laboratory equipment.....	165,000		
Office and health equipment.....	14,000		
(d) Contingency, at 15 percent of other costs.....			190,000
Total project cost.....			1,435,000

¹ Breakdown of space by type and unit cost:

Laboratory, 10,000 square feet, at \$47.....	\$470,00
Office, 3,800 square feet, at \$22.....	83,600
Shop, 2,400 square feet, at \$28.....	67,200
Service, utility, storage, and corridor areas, 6,800 square feet, at \$16.....	108,800
Total (23,000 square feet).....	729,600

The average space unit cost is \$31.70.

64-d-12 Plutonium research support building, Los Alamos Scientific Laboratory, N. Mex., \$655,000

This project provides for facilities designed to upgrade the research and development capabilities and the physical plant of the Laboratory and to afford needed permanent Laboratory and office space.

This building provides 18,600 gross square feet of office and drafting space, a machine shop, change rooms, and related areas to replace two inadequate wooden structures which are overcrowded, deficient both in space requirements and design, high in maintenance costs, and inefficient due to present dispersion of services and support activities.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection at 11 percent of construction costs.....			\$56,500
(b) Land and land rights.....			0
(c) Construction costs.....			512,500
Improvements to land.....		\$2,500	
Buildings (18,600 gross square feet).....	\$23.90	445,000	
Utilities.....		5,000	
Removal cost (dismantling and removing 2 1-story frame buildings).....		18,500	
Equipment.....		41,500	
Office and health equipment.....	\$15,000		
Moving existing machine shop and fixed monitor equipment.....	26,500		
(d) Contingency at 15 percent of other costs.....			86,000
Total, project cost.....			655,000

64-d-13 Radiochemistry building, Lawrence Radiation Laboratory, California,
\$5,900,000

This project provides a facility designed to upgrade research and development capabilities and the physical plant of the Laboratory and to afford needed permanent laboratory and office space.

This building provides 83,700 gross square feet of light laboratories, offices, and related areas to relieve an existing severe shortage of space within the chemistry division and to remove people from trailers and other inadequate facilities.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 11 percent of construction costs.....			\$534,000
(b) Land and land rights.....			0
(c) Construction costs.....			4,830,000
Improvements to land.....		\$25,000	
Buildings (83,700 gross square feet).....	¹ \$44.60	3,733,000	
Utilities.....		185,000	
Equipment.....		887,000	
Laboratory furniture.....	\$310,000		
Fume hoods.....	193,000		
Mass spectrometer.....	154,000		
8-channel counting system.....	40,700		
Other equipment.....	189,300		
(d) Contingency, at 10 percent of other costs.....			536,000
Total, project cost.....			5,900,000

¹ Cost above normal due to heavy shielding, special cooling, laboratory services (compressed air, gas, low conductivity water, demineralized water), and all interior partitions are concrete for shielding purposes.

64-d-14 Hazards control addition, Lawrence Radiation Laboratory, California,
\$1 million

This project provides a facility designed to upgrade research and development capabilities and the physical plant of the Laboratory and to afford needed permanent laboratory and office space.

The addition provides 18,960 gross square feet of light laboratories, offices, and related areas to provide permanent office and needed additional laboratory space to meet the increased programmatic demands for hazards control efforts. The personnel are presently located in severely overcrowded, technically inadequate facilities which are dispersed throughout the site.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection at 12 percent of construction costs.....			\$93,000
(b) Land and land rights.....			0
(c) Construction costs.....			775,000
Improvements to land.....		\$7,000	
Buildings (18,960 gross square feet).....	¹ \$31.00	588,000	
Utilities.....		50,000	
Equipment.....		130,000	
Laboratory furniture.....	\$75,000		
Fume hoods.....	30,000		
Miscellaneous laboratory equipment.....	25,000		
(d) Contingency at 15 percent of other costs.....			132,000
Total, project cost.....			1,000,000

¹ Unit cost based on recent experience at Livermore.

64-d-15 Plant engineering and services building, Lawrence Radiation Laboratory,
California, \$1,400,000

This project provides for a facility designed to upgrade research and development capabilities and the physical plant of the Laboratory and to afford needed permanent laboratory and office space.

This building provides 37,730 gross square feet of offices, drafting rooms, and special use rooms such as data processing and vaults for plant engineering and construction, plant services, inventory, security and AEC field engineering. The personnel are presently crowded in substandard World War II barracks and trailers.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection at 12 percent of construction costs.....			\$131,000
(b) Land and land rights.....			0
(c) Construction costs.....			1,096,000
Improvements to land.....		\$8,000	
Buildings (37,730 gross square feet).....	¹ \$27.90	1,053,000	
Utilities.....		9,000	
Equipment.....		16,000	
Removal cost less salvages (building 142 demolition).....		10,000	
(d) Contingency at 14 percent of other costs.....			173,000
Total project cost.....			1,400,000

¹ Unit cost based on recent experience at Livermore.

64-d-16 West cafeteria addition, Lawrence Radiation Laboratory, Calif., \$255,000

This project provides needed expansion in laboratory service facilities commensurate with the upgrading of direct program and administrative plant.

This addition provides 6,740 gross square feet for adequate serving and eating space for the present load and for the increasing number of employees assigned to this section of the site as permanent facilities are constructed to replace the temporary World War II structures.

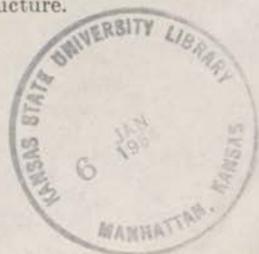
Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection at 10 percent of construction costs.....			\$20,000
(b) Land and land rights.....			0
(c) Construction costs.....			201,000
Improvements to land.....		\$1,000	
Buildings (6,740 gross square feet).....	\$24.70	166,300	
Utilities.....		3,000	
Equipment.....		30,700	
Hot and cold food servers.....	\$5,300		
Tables (60).....	5,000		
Install and relocate equipment.....	3,500		
Chairs (225).....	3,300		
Rodar freezer.....	2,650		
Stainless steel counter.....	2,600		
Dining room condiment stands.....	1,300		
Other equipment.....	7,050		
(d) Contingency at 15 percent of other costs.....			34,000
Total project cost.....			255,000

64-d-17 Craft shop addition, Lawrence Radiation Laboratory, California, \$200,000

This project provides for the needed expansion of laboratory service facilities commensurate with the upgrading of direct program and administrative plant.

This addition provides for a 10,800-gross-square-foot extension of the laboratory electrical shop, supply storage, and additional lumber storage to make possible the assignment of permanent work space to the laboratory staff of electricians, the isolation of noisy electric motor repair activities, and the provision of additional space for maintenance supplies. The present area is severely overcrowded and partially in a temporary, substandard World War II structure.



Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection at 11 percent of construction costs.....			\$17,200
(b) Land and land rights.....			0
(c) Construction costs.....			156,500
Improvements to land.....		\$2,000	
Buildings (10,800 gross square feet).....	\$13.75	148,500	
Utilities.....		3,000	
Equipment.....		1,000	
Removal cost less salvage.....		1,400	
(d) Contingency at 15 percent of other costs.....			28,300
Total project cost.....			200,000

64-d-18 Development laboratory, Sandia Base, N. Mex., \$3,780,000

This project provides for a facility designed to upgrade the research and development capabilities and the physical plant of the laboratory, and to afford needed additional space.

This building provides 76,000 gross square feet of laboratory office and related areas. It affords the additional laboratory space necessitated by the growth over recent years in the percentages of engineering staff and technical assistants within a constant laboratory employment total, as well as by the increased equipment space needed per technical person which has resulted from advanced equipment developments and more stringent weapons design tolerances.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 10 percent of construction costs.....			\$300,000
(b) Land and land rights.....			0
(c) Construction costs.....			2,990,000
Improvements to land.....		\$2,000	
Building (76,000 gross square feet).....	\$33.70	2,558,000	
Utilities.....		30,000	
Equipment.....		400,000	
Space simulation chamber.....	\$75,000		
High pressure and temperature system.....	60,000		
Magnetic systems.....	60,000		
Mass spectrometer.....	55,000		
High-vacuum system.....	45,000		
X-ray diffraction apparatus.....	20,000		
Small apparatus: Hoods, cabinets, and benches.....	\$5,000		
(d) Contingency, at 15 percent of other costs.....			490,000
Total project cost.....			3,780,000

64-d-19 Explosives facilities, Sandia Base, N. Mex., \$540,000

This project provides for a facility designed to upgrade the research and development capabilities and the physical plant of the laboratory, and to afford needed additional space.

This facility provides 4,200 gross square feet for an explosives chemistry laboratory and a preparation facility. They will be separated for safety and continuity of operations and will provide the additional space needed to analyze explosive materials in larger quantities as well as to adapt standard explosive charges to specific design characteristics.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 10 percent of construction costs.....			\$43,000
(b) Land and land rights.....			0
(c) Construction costs.....			428,000
Chemistry facility:			
Improvements to land.....		\$5,000	
Building (2,400 gross square feet).....	¹ \$50.00	120,000	
Utilities.....		25,000	
Equipment.....		65,000	
Subtotal.....		215,000	
Preparation facility:			
Improvements to land.....		13,000	
Building (1,800 gross square feet).....	¹ 44.40	80,000	
Storage magazines.....		5,000	
Utilities.....		60,000	
Equipment.....		55,000	
Subtotal.....		213,000	
(d) Contingency, at 15 percent of other costs.....			69,000
Total project cost.....			540,000

¹ High unit cost per square foot is due to special construction and equipment for safe operation of these facilities.

64-d-20 Classified technical reports building addition, Sandia Base, N. Mex., \$500,000

This project provides for a facility designed to upgrade the research and development capabilities and the physical plant of the laboratory, and to afford needed additional space.

This building provides 10,200 gross square feet of library, reading room, vault and office space which will permit the centralizing of all of the classified technical books and reports which are essential to the laboratory's scientists and engineers. Thousands of such valuable documents are dispersed in hundreds of safes and files throughout the site. This results in wasted time and effort, duplication of research and development work previously performed by others, loss of information through individual disposal actions, and general inefficient use of technical staffs and facilities.

Details of cost estimate

	Unit cost	Item cost	Total cost
(a) Engineering, design, and inspection, at 10 percent of construction costs.....			\$40,000
(b) Land and land rights.....			0
(c) Construction costs.....			403,000
Building (10,200 gross square feet).....	\$28.30	\$288,500	
Utilities.....		37,500	
Equipment (library stacks).....		65,000	
Miscellaneous.....		12,000	
(d) Contingency, at 13 percent of other costs.....			57,000
Total project cost.....			500,000

64-d-21 Control point additions, Nevada Test Site, Nevada, \$630,000

This project provides for facilities designed to increase the underground testing capability of the weapons laboratories by upgrading control point facilities at the Nevada Test Site. The project provides for a communications building and for device handling and storage facilities.

The communications building included in this project will provide 11,000 square feet containing a radio control room, microwave terminals, offices, frame and equipment room, storage space, and equipment maintenance space to meet the complex communications requirements at control point 1. The device storage and handling buildings provide 10,320 square feet for underground explosive magazines, a device storage building, a handling building, a warehouse, and paved roads to each building.

Details of cost estimate

	Communica- tions building	Device stor- age and assembly building	Total cost
(a) Engineering, design, and inspection, at 10 percent of construction costs.....	\$21,600	\$28,400	\$50,000
(b) Land and land rights.....	0	0	0
(c) Construction costs.....	215,000	283,400	499,400
Improvements to land.....	3,000	61,500	-----
Buildings.....	209,000	208,900	-----
Utilities.....	2,000	8,000	-----
Equipment.....	2,000	5,000	-----
(d) Contingency, at 15 percent of other costs.....	37,400	43,200	80,600
Total project cost.....	275,000	355,000	630,000

Summary of changes—Operating expenses, fiscal year 1964

[In thousands of dollars]

	In budget	Revised estimate	Increase (+) or decrease (-)
Program by activities:			
Accrued costs by program:			
Raw materials.....	335,771	324,843	-10,928
Special nuclear materials.....	480,471	480,471	-----
Weapons.....	688,328	782,969	94,641
Reactor development.....	530,548	530,548	-----
Physical research.....	219,077	219,077	-----
Biology and medicine.....	76,973	76,973	-----
Training, education, and information.....	17,194	17,194	-----
Civilian applications of—			
Isotopes.....	9,260	9,260	-----
Nuclear explosives.....	15,100	15,100	-----
Communities.....	10,081	10,081	-----
Program direction and administration.....	73,415	73,415	-----
Security investigations.....	8,000	6,950	-1,050
Cost of work for others.....	6,800	6,240	-560
Total program costs.....	2,471,018	2,553,121	82,103
Change in selected resources.....	36,040	53,252	17,212
Total obligations.....	2,507,058	2,606,373	99,315
Financing:			
Unobligated balance brought forward.....	-54,058	-150,873	-96,815
Advances and reimbursements from non-Federal sources (revenues applied).....	-29,500	-32,000	-2,500
New obligational authority (appropriation).....	2,423,500	2,423,500	-----

SUMMARY OF CHANGES—OPERATING EXPENSES, FISCAL YEAR 1964

Raw materials, —\$10,928,000

The decrease of \$10,928,000 results from—

1. An estimated decrease in deliveries of 355 tons of U_3O_8 costing \$5.8 million from domestic procurement as a result of certain mill operators rescheduling their deliveries during the 1964-66 period as a result of the stretchout program.

2. An estimated decrease in deliveries of 200 tons of U_3O_8 costing \$5.1 million as a result of a rescheduling of deliveries by Canada.

Weapons, \$94,641,000

The amended fiscal year 1964 budget estimate for weapons provides for increased underground testing and other safeguards. The net increase of \$94,641,000 includes an increase of \$109,762,000 to (1) maintain a readiness capability for atmospheric test and (2) to conduct increased underground tests to yield additional new information applicable to development of weapons which when applied to weapons production will greatly enhance the capabilities of the Armed Forces. The increased test requirements are offset by a decrease of \$15,121,000 in other phases of the weapons program.

Security investigations, —\$1,050,000

The reduction in the amended fiscal year 1964 budget is due primarily to a reduced unit cost of investigations performed by the Civil Service Commission based on billing rates furnished by that agency.

Cost of work for others, —\$560,000

The decrease of \$560,000 principally reflects a reduction in the estimated sales of heavy water from 75 to 50 tons. This reduction of 25 tons costing \$700,000 is based on more current information and is partially offset by minor increases in several categories.

Revenues, —\$2,500,000

The increased revenues are principally the result of increased sales of source and special nuclear materials.

Summary of changes—Plant and capital equipment, fiscal year 1964

[In thousands of dollars]

	In budget	Revised estimate	Increase (+) or decrease (-)
Program by activities: Facilities for—			
Raw materials.....	37	37	
Special nuclear materials.....	60,930	60,930	
Weapons.....	108,351	126,296	17,945
Reactor development.....	143,929	131,929	-12,000
Physical research.....	91,692	91,692	
Biology and medicine.....	6,245	6,245	
Training, education, and information.....	719	719	
Civilian applications of—			
Isotopes.....	2,240	2,240	
Nuclear explosives.....	450	450	
Communities.....	6,237	6,237	
Administrative.....	670	670	
Construction planning and design.....	5,000	5,000	
Total obligations.....	426,500	432,445	5,945
Financing: Unobligated balance brought forward.....	-6,300	-6,300	
New obligational authority (appropriation).....	420,200	426,145	5,945

GENERAL STATEMENT FOR OPERATING EXPENSES

ESTIMATE OF APPROPRIATION

This book contains the budget estimates for the appropriation "Operating expenses" for fiscal year 1964. The estimates provide for total obligations of \$2,507,058,000 to be funded by (1) a new appropriation of \$2,423,500,000, (2) the utilization of an unobligated balance of \$54,058,000 estimated to be available at the end of fiscal year 1963, and (3) an estimated \$29,500,000 to be received as revenues from non-Federal sources during the fiscal year.

ESTIMATES OF COSTS AND OBLIGATIONS

The budget estimates for this appropriation are stated in terms of accrued costs for each of the AEC's operating programs. "Accrued costs" denotes the actual application of labor, materials, and services to the program during the year, but excludes depreciation of facilities used in the operations. The AEC does, however, maintain accounts for depreciation for the purpose of determining total costs of production and for use in establishing prices for services rendered or products sold to others.

Capital equipment not related to construction, formerly included in this appropriation on a cost basis, is now reflected on an obligational basis in the "Plant and capital equipment" appropriation in accordance with the direction of the Appropriations Committee of the House of Representatives as expressed in House Report No. 2223, August 14, 1962, on the public works appropriation bill for fiscal year 1963.

The costs of operation are reconciled to the total obligations to be incurred during the year by estimating the buildup or decrease during the year of the resources that are to be applied to future years' operations. These estimates are

included in the section titled, "Increase or Decrease in Selected Resources" and include inventories and undelivered orders.

From total obligations are deducted the revenues estimated to be obtained from non-Federal sources in order to arrive at the amount of appropriations required. These revenues are obtained from AEC-owned community and housing operations, from the sale of products, from services performed for others, and from other miscellaneous sources. These revenues are identified and summarized under the tab "Revenues Applied."

The following table summarizes the accrued costs for each program, and the total obligations for fiscal years 1962, 1963, and 1964, except that accrued costs and obligations pertaining to capital equipment not related to construction in fiscal years 1962 and 1963 have been omitted to provide comparability with fiscal year 1964, since the estimates for that year include such equipment under the appropriation "Plant and Capital Equipment." The detailed justifications, beginning on page 25, present the programs in the same order as they appear on this summary table.

Summary of accrued operating costs by program reconciled to net obligations

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Accrued costs by program:			
Raw materials.....	\$537,197,633	\$477,715,000	\$335,771,000
Special nuclear materials.....	491,101,519	489,286,000	480,471,000
Weapons.....	658,579,234	721,660,000	688,328,000
Reactor development.....	396,683,399	469,282,000	530,548,000
Physical research.....	159,626,617	182,670,000	219,077,000
Biology and medicine.....	58,255,492	68,645,000	76,973,000
Training, education, and information.....	12,735,676	14,420,000	17,194,000
Civilian applications of:			
Isotopes.....	5,150,760	6,443,000	9,260,000
Nuclear explosives.....	8,864,671	9,250,000	15,100,000
Community.....	8,427,795	9,035,000	10,081,000
Program direction and administration.....	59,298,571	65,234,000	73,415,000
Security investigations.....	7,748,018	7,665,000	8,000,000
Cost of work for others.....	6,935,893	6,400,000	6,800,000
Adjustment to prior year costs.....	9,207,954		
Total accrued program costs.....	2,419,813,232	2,527,705,000	2,471,018,000
Changes in selected resources.....	-52,015,002	157,618,277	36,040,000
Total obligations for operating expenses.....	2,367,798,230	2,685,323,277	2,507,058,000
Less revenues applied.....	33,700,177	29,000,000	29,500,000
Net obligations (financed by appropriated funds).....	2,334,098,053	2,656,323,277	2,477,558,000

FINANCING OF OBLIGATIONS

The financing of the estimated total obligations of \$2,507,058,000 proposed in the budget estimates for fiscal year 1964, together with comparable data for fiscal years, 1962 and 1963, is summarized in the following table:

Summary of financing

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Funds available for obligations:			
Unobligated balance, beginning of year.....	\$154,082,623	\$17,697,504	\$54,058,000
Appropriation.....	2,352,001,000	2,872,224,000	2,423,500,000
Transfer to "Operating expenses, Public Building Services," General Services Administration (75 Stat. 353).....	-23,066	-231,227	
Revenues received from non-Federal sources.....	33,700,177	29,000,000	29,500,000
Comparability transfer to "Plant acquisition and construction," Atomic Energy Commission.....	-154,265,000	-179,309,000	
Total funds available for obligation.....	2,385,495,734	2,739,381,277	2,507,058,000
Less unobligated balance, end of year.....	17,697,504	54,058,000	
Total obligations incurred.....	2,367,798,230	2,685,323,277	2,507,058,000

EXPENDITURES FOR OPERATING EXPENSES

Expenditures from the "Operating expenses" appropriation for fiscal year 1964 are estimated at \$2,385 million. The estimated amounts available for expenditure in fiscal years 1962, 1963, and 1964, the expenditures for each year, and the remaining unexpended balances are shown in the following table:

Expenditure analysis

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Funds available for expenditure:			
Unexpended balance, beginning of year:			
Obligated.....	\$858,316,921	\$836,726,453	\$1,107,358,730
Unobligated balance.....	154,082,623	17,697,504	54,058,000
New appropriation.....	2,352,001,000	2,872,224,000	2,423,500,000
Transfer to "Operating expenses, Public Buildings Services," General Services Administration (75 Stat. 353).....	-23,066	-231,227	
Transfer of estimated unpaid obligations for equip- ment to "Plant and capital equipment," Atomic Energy Commission.....			-75,709,000
Total funds available for expenditure.....	3,364,377,478	3,726,416,730	3,509,207,730
Less expenditures.....	1 2,509,953,521	2,565,000,000	2,385,000,000
Unexpended balance, end of year:			
Obligated.....	836,726,453	1,107,358,730	1,124,207,730
Unobligated balance.....	17,697,504	54,058,000	
Unexpended balance, end of year.....	854,423,957	1,161,416,730	1,124,207,730

¹ These amounts are not comparable to the expenditures estimated for fiscal year 1964 in that fiscal year 1964 expenditures do not include amounts related to obligations for capital equipment not related to construction which are now shown under the "Plant and capital equipment" appropriation rather than the "Operating expenses" appropriation as is the case for fiscal years 1962 and 1963. The following amounts should be subtracted from the fiscal year 1962 and 1963 expenditure estimates to arrive at amounts comparable with the fiscal year 1964 expenditures: fiscal year 1962, \$137,984,000; fiscal year 1963, \$155,000,000.

HIGHLIGHTS OF OPERATING PROGRAMS

There follows a brief description of each of the programs set forth in the summary on page 2:

1. *Raw materials program.*—Operating costs for the raw materials program are estimated at \$335.8 million in fiscal year 1964, compared with fiscal year 1963 estimated costs of \$477.7 million and fiscal year 1962 actual costs of \$537.2 million. The raw materials program provides for procurement of uranium concentrates from foreign and domestic sources. The decrease in quantities of uranium concentrates to be procured in fiscal year 1964 is principally the result of (a) reduced deliveries from Canadian producers in accordance with the provisions of the contract, and (b) deferral of domestic deliveries as a result of the stretchout program announced on November 17, 1962.

2. *Special nuclear materials program.*—Operating costs for the special nuclear materials program are estimated at \$480.5 million in fiscal year 1964, compared with fiscal year 1963 estimated costs of \$489.3 million, and fiscal year 1962 actual costs of \$491.1 million. Uranium concentrates are processed into feed materials from which (a) plutonium is produced in the reactors at Richland, Wash., and Savannah River, S.C., and (b) the isotope uranium 235 is extracted in plants at Oak Ridge, Tenn., Paducah, Ky., and Portsmouth, Ohio. Production of special nuclear materials will be at rates required to meet weapons production schedules and nonweapons requirements. Work will continue on process improvements to assure continuity and safety of operation and more economical methods of production.

3. *Weapons program.*—Operating costs for the weapons program are estimated at \$688.3 million in fiscal year 1964 compared with fiscal year 1963 estimated costs of \$721.7 million and fiscal year 1962 actual costs of \$658.6 million. The weapons program includes the production of atomic weapons, the maintenance of stockpiled weapons in a state of constant readiness, the development, design, and testing of new weapons types, and participation with the Department of Defense in experimental programs for detecting nuclear detonations at high altitude and underground.

4. *Reactor development program.*—Operating costs for the reactor development program are estimated at \$530.5 million in fiscal year 1964 compared with fiscal year 1963 estimated costs of \$469.3 million and fiscal year 1962 actual costs of \$396.7 million. Emphasis will continue to be placed on advancing power reactor technology in order to achieve large scale generation of economic electrical energy from atomic reactors. Cooperative endeavors between the Commission and industrial groups, as well as with the European Atomic Energy Community (EURATOM) and Canada, will be continued; and a cooperative research and development program with West German authorities will be initiated.

The estimates provide for research and development applicable to advanced systems as well as to many current reactor designs, fuel cycle development, a program of reactor environmental and aerospace nuclear safety, and for development of separations systems for processing irradiated fuel elements.

Work will also be continued on developing reactors to meet military needs for power in remote areas, to propel merchant and naval vessels, rockets, and missiles, and to provide electric power and heat for satellites. Development of radioisotope power sources for these latter as well as terrestrial applications will also be continued. This research and developmental effort will also provide information useful in the development of civilian power reactors.

Operation of test facilities and experimental reactors will be continued at the National Reactor Testing Station, Idaho, and at other locations.

5. *Physical research program.*—Operating costs for physical research are estimated at \$219.1 million in fiscal year 1964 compared with fiscal year 1963 estimated costs of \$182.7 million and fiscal year 1962 actual costs of \$159.6 million. The physical research program consists of theoretical and experimental investigations required to support the Commission's immediate and long-range objectives for utilizing nuclear energy. Advances achieved in the past can be traced back to similar laboratory investigations. In the atomic energy program, research plays a relatively more important role than in other industrial operations of comparable size. The phenomena dealt with are close to the fringes of scientific knowledge. Unusual materials are employed and their nuclear, as well as their chemical and physical properties, must be determined. The temperatures and radiation densities at which these materials are used are outside the range of previous experience in industrial technology.

6. *Biology and medicine program.*—Operating costs for research in biology and medicine are estimated at \$77 million for fiscal year 1964, compared with estimated costs of \$68.6 million in fiscal year 1963 and actual costs of \$58.3 million in fiscal year 1962. Primary emphasis will continue to be placed on the protection of the health and safety of atomic energy plant workers and the general populace from the hazards of atomic energy operations. Research on radioactive fallout problems and related research in the biological hazards of radiation will be expanded with increasing attention given to large-scale studies of chronic effects of radiation. Continued emphasis will be placed on research efforts of pertinence in the field of industrial uses of atomic energy. Close liaison will continue to be maintained with other agencies performing functions interrelated with Commission bio-medical interests. Research is carried on by Commission laboratories, universities, and other independent institutions.

7. *Training, education, and information.*—Operating costs for the training, education, and information program are estimated at \$17.2 million in fiscal year 1964 compared to fiscal year 1963 estimated costs of \$14.4 million and fiscal year 1962 actual costs of \$12.7 million. Primary program emphasis will continue to be placed on broadening the base of nuclear technology at home and abroad. Program efforts are directed toward provision of assistance to colleges and universities in establishing nuclear curricula; provision of assistance to States for training in radiation control; operation, through contract, of schools and the conduct of specialized courses; offering of graduate fellowships in the nuclear energy field; presentation of international conferences, studies, and exhibits; and development and dissemination of technical information.

8. *Civilian applications of.*—

Isotopes: Operating costs for this program are estimated at \$9.3 million in fiscal year 1964 compared to fiscal year 1963 estimated costs of \$6.4 million and fiscal year 1962 actual costs of \$5.2 million. The program consists of research and development activities required to accelerate realization of the potentially vast uses of radioisotopes and radiation technology. The program will provide for expanding the technology and utilization of isotopes with particular attention to civilian applications; and developing, through research and development activities, application of high level or massive radiation, large-scale economic uses of

fission product wastes, and methods and technology for preservation of foods by irradiation.

Nuclear explosives: The operating costs for civilian applications of nuclear explosives (PLOWSHARE) are estimated at \$15.1 million for fiscal year 1964 compared to estimated costs of \$9.3 million in fiscal year 1963 and actual costs of \$8.9 million in 1962. The fiscal year 1964 program provides for two demonstration projects directed toward excavation applications, one scientific project to study the feasibility of producing heavy elements, and supporting research and development work.

9. *Community.*—Although plans for disposal are being made, AEC will continue to operate the community of Los Alamos, N. Mex., under contract during fiscal year 1964. In addition, assistance payments will continue to be made to the former AEC communities of Oak Ridge, Tenn., and Richland, Wash. Operating costs of the program are estimated at \$10.1 million in fiscal year 1964 compared to fiscal year 1963 estimated costs of \$9 million and fiscal year 1962 actual costs of \$8.4 million.

10. *Program direction and administration.*—Under the general heading of program direction and administration are grouped together the salary costs and other expenses of Commission personnel engaged in general management, executive direction, and technical supervision of program operations; the negotiation and administration of contracts; other related administrative activities; and the discharge of regulatory functions. The corresponding costs for Commission personnel engaged in nonadministrative and nonregulatory activities directly related to a specific program are included in that program, as for example, personnel safeguarding classified shipments or providing fire protection for a community. Expenses of personnel of other Government agencies, including their travel, doing work for the Commission are treated as contractual services, and are, therefore, not included in the AEC detail of personal services and travel.

Estimated costs of \$73.4 million will be incurred in fiscal year 1964 for program direction and administration compared with fiscal year 1963 estimated costs of \$65.2 million and fiscal year 1962 actual costs of \$59.3 million. An increase in staff of 148 employees is budgeted for fiscal year 1964 under this program. The increase of \$8.2 million is related principally to costs resulting from the provisions of the Postal Service and Federal Employees Salary Act of 1963, Public Law 87-793 and to increase in staff provided for in 1964. The costs in fiscal year 1964 represent 3 percent of the total operating costs, compared with about 2.5 percent in fiscal years 1963 and 1962.

11. *Security investigations.*—This program covers the costs of investigations performed by the Civil Service Commission and the Federal Bureau of Investigation, at the request of the Commission, of persons to be employed on work involving access to restricted data, under the provisions of the Atomic Energy Act of 1954, as amended. Costs of security investigations in fiscal year 1964 are estimated at \$8 million compared with fiscal year 1963 estimated costs of \$7.7 million and fiscal year 1962 actual costs of \$7.7 million. The fiscal year 1964 increase is related to costs resulting from the Postal Service and Federal Employees Salary Act of 1963, Public Law 87-793. This increase is partially offset by a reduction in full background investigations.

12. *Cost of work for others.*—This program includes costs incurred by the Commission in furnishing materials and services to industrial organizations and other private parties apart from those which it provides normally for its own basic program. The costs are incurred only upon the request of others. Charges are made for these materials and services and the revenues derived are included under "Revenues applied." Costs of work for others are estimated to be \$6.8 million in fiscal year 1964, compared with \$6.4 million in fiscal year 1963 and \$6.9 million in fiscal year 1962. The increase of \$0.4 million in fiscal year 1964 over fiscal year 1963 is principally related to a higher sales level of heavy water.

13. *Increase or decrease in selected resources.*—This program covers changes in inventory stocks held by AEC and its contractors, collateral funds, and goods and services on order under contract. The appropriation requirements for these items are based on the changes in balances from the previous fiscal year. Balances at end of fiscal year 1964 are estimated at \$986.5 million as compared with \$950.5 million in fiscal year 1963 and \$792.9 million fiscal year 1962. The net increase of \$36 million in fiscal year 1964 results principally from: (1) increases in inventory balances for stores and isotopes based on projected program requirements; (2) increases in goods and services on order related to expanded levels of effort in weapons production and the reactor development and physical research programs; (3) increases in balances related to the cooperative arrangements program;

and (4) decreases in balances related to procurement of Canadian uranium concentrates.

14. *Revenues applied.*—This program includes income from sale and lease of products and from services rendered, revenues from communities, and other miscellaneous income items. These revenues are applied against Atomic Energy Commission appropriation requirements. Revenues are estimated \$29.5 million for fiscal year 1964, compared to an estimate of \$29 million for fiscal year 1963. The increase of \$0.5 million in fiscal year 1964 is principally related to a higher sales level of heavy water and increases in income from charges made for source and special nuclear material consumed, partially offset by decreases in revenue from the sale of steam at Shippingport and from income from services performed. Revenues for fiscal year 1962 were \$33.7 million.

U.S. ATOMIC ENERGY COMMISSION

JUSTIFICATION FOR PROPOSED LANGUAGE CHANGES—OPERATING EXPENSES

Proposed changes in language are indicated as follows: Language enclosed in brackets [] indicates proposed deletions; language in italics indicates proposed insertions.

1. "[Purchase of equipment; purchase,] *hire*, maintenance [.] and operation of aircraft; * * * [purchase (not to exceed seven hundred and forty, of which four hundred and ten are for replacement only) and] *hire of passenger motor vehicles.*"

The above changes provide for deletion from the "Operating expenses" appropriation authority for the acquisition of capital equipment not related to construction, since such authority will now be contained in the "Plant and capital equipment" appropriation in accordance with the statement of the Appropriations Committee of the House of Representatives as contained in House Report No. 2223, August 14, 1962, on the public works appropriation bill, 1963. They also provide for the substitution of the authority for the hire, maintenance, and operation of aircraft in place of the authority for the purchase, maintenance, and operation of aircraft.

2. "[~~\$2,872,224,000~~] *\$2,423,500,000*, and any moneys (except sums received from disposal of property under the Atomic Energy Community Act of 1955 (42 U.S.C. 2301)) received by the Commission, notwithstanding the provisions of section 3617 of the Revised Statutes (31 U.S.C. 484), to remain available until expended."

To reflect the fiscal year 1964 appropriation amount.

JUSTIFICATION FOR PROPOSED LANGUAGE CHANGES—GENERAL PROVISIONS

The proposed change in the language for the administrative provisions is described below. Language enclosed in brackets [] indicates proposed deletions; language in italics indicates proposed insertions.

1. "Any appropriation available under this or any other Act to the Atomic Energy Commission may initially be used subject to limitations in this Act during the fiscal year [1963] *1964* to finance the procurement of materials, services, or other costs which are a part of work or activities for which funds have been provided in any other appropriation available to the Commission: * * *"

This change makes the provision applicable to fiscal year 1964.

2. "Not to exceed 5 per centum of appropriations made available for the fiscal year [1963] *1964* for 'Operating expenses' and ['Plant acquisition and construction'] '*Plant and capital equipment*' may be transferred between such appropriations, but neither such appropriation, except as otherwise provided herein, shall be increased by more than 5 per centum by any such transfers, and any such transfers shall be reported promptly to the Appropriations Committees of the House and Senate."

This change provides for a change in the title of one of the Commission's appropriations and makes the provision applicable to fiscal year 1964.

U.S. ATOMIC ENERGY COMMISSION—FISCAL YEAR 1964 BUDGET ESTIMATES

GENERAL STATEMENT FOR PLANT AND CAPITAL EQUIPMENT

Summary of requirements for fiscal year 1964

The budget estimates for the appropriation "Plant and capital equipment" for the fiscal year 1964 provide for estimated obligations of \$426,500,000 to be funded by (1) a new appropriation of \$420,200,000, and (2) the utilization of

an unobligated balance of \$6,300,000 estimated to be available at the end of fiscal year 1963. Of the estimated total obligations, \$214.6 million is required for projects for which authorization is being requested in the 1964 authorization bill, \$45.3 million is required for projects previously authorized, and \$166.6 million is required for capital equipment not related to construction.

Revision in appropriation structure

The appropriation "Plant and capital equipment" replaces the previous appropriation title "Plant acquisition and construction." The appropriation with the new title includes funds for the purchase and construction of plant and expenses incidental thereto, formerly included under plant acquisition and construction, and funds for capital equipment not related to construction previously funded under the "Operating expenses" appropriation. The increased scope of the proposed appropriation to include capital equipment not related to construction is in keeping with the intent of the Appropriations Committee of the House of Representatives as expressed in the report on the public works appropriation bill, 1963 (H. Rept. No. 2223, Aug. 14, 1962).

A summarization of estimated fiscal year 1964 obligations by program follows:

Summary of fiscal year 1964 obligations

	Funding for projects authorized in prior years	Funding for projects included in the 1964 authorization act	Capital equipment not related to construction	Total
Raw materials.....		\$25,000	\$12,000	\$37,000
Special nuclear materials.....		32,000,000	28,930,000	60,930,000
Weapons.....		43,695,000	64,656,000	108,351,000
Reactor development.....		115,430,000	28,499,000	143,929,000
Physical research.....	\$36,000,000	18,600,000	37,092,000	91,692,000
Biology and medicine.....		2,645,000	3,600,000	6,245,000
Training, education, and information.....		250,000	469,000	719,000
Civilian applications of:				
Isotopes.....			2,240,000	2,240,000
Nuclear explosives.....			450,000	450,000
Community.....	4,329,000	1,817,000	91,000	6,237,000
Administrative.....		100,000	570,000	670,000
Construction planning and design.....	5,000,000			5,000,000
Total obligations.....	45,329,000	214,562,000	166,609,000	426,500,000

Summary of obligations

The following table summarizes the total obligations for each of the programs for fiscal year 1962, fiscal year 1963, and fiscal year 1964. The data for fiscal years 1962 and 1963 have been adjusted to include obligations by program for capital equipment not related to construction (budgeted under operating expenses in those years) to provide comparability with the data for fiscal year 1964. This comparability adjustment totals \$154,265,000 in fiscal year 1962 and \$179,309,000 in fiscal year 1963. The detailed justifications beginning on page 30 present the programs in the same order as they appear on this summary table.

Summary of obligations by program

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Raw materials.....	\$35,886	\$83,000	\$37,000
Special nuclear materials.....	53,392,418	143,249,000	60,930,000
Weapons.....	98,075,247	123,376,000	108,351,000
Reactor development.....	132,137,221	151,276,786	143,929,000
Physical research.....	82,586,427	143,115,000	91,692,000
Biology and medicine.....	6,321,133	8,576,000	6,245,000
Training, education, and information.....	398,615	638,000	719,000
Civilian applications of:			
Isotopes.....	1,098,495	2,138,000	2,240,000
Nuclear explosives.....	251,000	415,000	450,000
Community.....	3,820,653	2,570,000	6,237,000
Administrative.....	511,888	900,000	670,000
Construction planning and design.....			5,000,000
Total obligations.....	378,588,983	576,336,786	426,500,000

Financing of obligations

The financing of the estimated total obligations of \$426,500,000 proposed in the budget estimates for fiscal year 1964, together with comparable data for fiscal years 1962 and 1963, is summarized in the following table:

Summary of financing

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Funds available:			
Unobligated balance at beginning of year.....	\$160,807,769	\$135,722,786	\$6,300,000
Recovery of prior year obligations.....	3,879,000	4,860,000	
Appropriation.....	195,360,000	262,745,000	420,200,000
Comparability transfer from "Operating expenses, Atomic Energy Commission".....	154,265,000	179,309,000	
Net amount available for obligation.....	514,311,769	582,636,786	426,500,000
Unobligated balance at end of year.....	135,722,786	6,300,000	
Total obligations.....	378,588,983	576,336,786	426,500,000

Expenditures for plant and capital equipment

Expenditures from the plant and capital equipment appropriation for fiscal year 1964, are estimated to be \$455 million. The estimated amounts available for expenditure in fiscal years 1962, 1963, and 1964, the expenditures for each year, and the remaining unexpended balances are shown in the following table:

Expenditure analysis

	Actual, fiscal year 1962	Estimate, fiscal year 1963	Estimate, fiscal year 1964
Funds available for expenditure:			
Unexpended balance, beginning of year.....	\$464,560,881	\$382,905,733	\$380,650,733
Appropriation.....	195,360,000	262,745,000	420,200,000
Transfer of estimated unpaid obligations for equipment from "Operating expenses, Atomic Energy Commission".....			75,700,000
Total funds available for expenditure.....	659,920,881	645,650,733	876,550,733
Less expenditures.....	1 277,015,148	1 265,000,000	455,000,000
Unexpended balance, end of year.....	382,905,733	380,650,733	421,550,733

¹ These amounts are not comparable to the expenditures estimated for fiscal year 1964 in that fiscal year 1964 expenditures include amounts related to equipment obligations which are now shown under the plant and capital equipment appropriation rather than the operating expenses appropriation as is the case for fiscal years 1962 and 1963. The following amounts should be added to fiscal year 1962 and 1963 expenditure estimates to arrive at amounts comparable to the fiscal year 1964 expenditures: Fiscal year 1962, \$137,984,000; fiscal year 1963, \$155,000,000.

HIGHLIGHTS OF PLANT AND CAPITAL EQUIPMENT PROGRAMS

As shown in the table on page 29, estimates are presented on an obligation basis for each of the AEC's functional programs. The highlights of the estimates for which appropriations are required in fiscal year 1964 are as follows:

1. *Raw materials.*—This activity provides for minor construction to support the Government-owned procurement installations, and for procurement of capital equipment necessary to support the operating program. Obligational requirements of \$37,000 in 1964, include \$25,000 for minor modifications and improvements to existing plant or installations, and \$12,000 for capital equipment not related to construction.

2. *Special nuclear materials.*—Total obligations for special nuclear materials plant and capital equipment in fiscal year 1964 are estimated at \$60.9 million of which \$32 million is necessary to provide for new projects proposed for authorization and \$28.9 million is estimated for capital equipment not related to construction. The \$32 million proposed for new projects includes \$11.1 million for waste

disposal facilities at the Savannah River and Idaho plants, \$3.7 million for waste management facilities at Richland, \$0.7 million for an additional boiler for a heating plant at Richland, \$5 million for modifications to production and supporting installations, and \$11.5 million for general plant projects.

3. *Weapons.*—Total obligations for weapons plant and capital equipment in fiscal year 1964 are estimated at \$108.4 million of which \$43.7 million is necessary to provide for new projects proposed for authorization and \$64.7 million is estimated for capital equipment not related to construction. The new projects include \$30.7 million for additional production, development, and supporting facilities, and \$13 million for general plant projects.

4. *Reactor development.*—Total obligations for reactor development plant and capital equipment in fiscal year 1964 are estimated at \$143.9 million of which \$115.4 million will provide for new projects proposed for authorization, and \$28.5 million is estimated for capital equipment not related to construction. The new projects include \$30 million for a spectral shift power reactor; \$17 million for a fast reactor test facility; \$12 million for a military compact reactor; \$19.4 million for nuclear safety engineering test facilities; \$7.3 million for a thorium-uranium fuel cycle development facility; and \$12 million for general plant projects.

5. *Physical research.*—Total obligations for physical research plant and capital equipment in fiscal year 1964 are estimated at \$91.7 million of which \$18.6 million is for new projects requiring authorization principally for a large Van de Graaff facility for low energy physics research and for accelerator improvements. Also included is \$36 million of additional obligations for the Stanford linear electron accelerator and \$37.1 million for capital equipment not related to construction.

6. *Biology and medicine.*—Obligations for biology and medicine plant and capital equipment in fiscal year 1964 are estimated at \$6.2 million of which \$2.6 million is for new projects to be authorized, including \$1.9 million for support of biomedical research projects in atomic energy and \$0.7 million for general plant projects. Also included is \$3.6 million for capital equipment not related to construction.

7. *Training, education and information.*—This activity provides for minor construction in connection with the Commission's training program and for procurement of capital equipment to support the operating program. Obligational requirements of \$0.7 million in 1964 include \$0.2 million for new projects requiring authorization and \$0.5 million for capital equipment not related to construction.

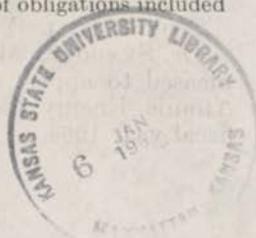
8. *Isotopes development.*—Obligations for isotopes development in fiscal year 1964 are estimated at \$2.2 million for capital equipment not related to construction.

9. *Civilian applications of nuclear explosives.*—Obligations for civilian applications of nuclear explosives will provide \$0.5 million for capital equipment not related to construction.

10. *Community.*—Total obligations for Los Alamos community plant and capital equipment in fiscal year 1964 are estimated at \$6.2 million and will provide \$1.8 million for new projects proposed for authorization in fiscal year 1964, \$4.3 million to partially fund a previously authorized community disposal project and \$0.1 million for capital equipment not related to construction. The \$1.8 million estimated for new projects in fiscal year 1964 will provide for the following: \$0.6 million for an additional water distribution system; \$0.2 million for additional elementary school classrooms; \$0.2 million for an additional water well; and \$0.8 million for general plant projects.

11. *Administrative.*—This activity provides for improvements and modifications of administrative facilities at the Commission headquarters in Germantown, Md., and for procurement of capital equipment to support the operating program. Obligational requirements of \$0.7 million in 1964 include \$0.1 million for new projects requiring authorization and \$0.6 million for capital equipment not related to construction.

12. *Construction planning and design.*—This activity will permit engineering and design on projects prior to their being proposed for authorization, or a highly selective basis where the complexity or magnitude of the projects require such advance work in order to arrive at a reliable cost estimate and project scope in support of the project authorization. There is \$5.0 million of obligations included in the estimates for this purpose.



U.S. ATOMIC ENERGY COMMISSION

EXPLANATION OF PROPOSED LANGUAGE CHANGES—PLANT AND CAPITAL EQUIPMENT

Proposed changes in language are indicated as follows: Language enclosed in black brackets indicates proposed deletions, and italic indicates proposed insertion of new language.

1. "[PLANT ACQUISITION AND CONSTRUCTION] *PLANT AND CAPITAL EQUIPMENT*".

This change provides for changing the title of the appropriation to reflect the fact that capital equipment not related to construction will now be purchased under this appropriation in accordance with the statement of the Appropriations Committee of the House of Representatives as contained in House Report No. 2223, August 14, 1962, on the public works appropriation bill, 1963.

2. "For expenses of the Commission, as authorized by law, in connection with the purchase and construction of plant and the *acquisition of capital equipment * * * purchase (not to exceed four hundred and twenty-three for replacement only, including two at not to exceed \$3,000 each) and hire of passenger motor vehicles;*".

This change provides for the acquisition of equipment, including passenger motor vehicles, from this appropriation. Authorization of the procurement in fiscal year 1964 of 423 passenger motor vehicles which are required for replacement of older vehicles is requested. The estimate includes the replacement of two medium weight sedans at \$3,000 each. All vehicles to be replaced will meet or exceed the GSA replacement standards.

Contractors are assigned passenger motor vehicles as Government-furnished equipment and operate them in carrying out the Commission's program. The passenger vehicle fleet will number 2,442 at the end of fiscal year 1964.

3. "[~~\$262,745,000~~] *\$426,145,000*, to remain available until expended".

This change provides for deletion of the amount appropriated in fiscal year 1963 and insertion of amount of the fiscal year 1964 appropriation request.

4. "Provided, That [not to exceed \$4,500,000 of this appropriation for carrying out improvements on U.S. Highway 95, Nevada, as authorized in the Commission's 1963 authorization act, may be transferred to the Bureau of Public Roads, Department of Commerce]".

This change provides for deletion of language not required.

5. "Provided, That the *obligated balance as of June 30, 1963, of amounts included in appropriations to the Atomic Energy Commission for 'Operating expenses', for capital equipment not related to construction, shall be merged with this appropriation:*".

This change provides for transfer to this appropriation of the remaining obligated balance, as of June 30, 1963, of appropriations previously made to the Commission under the appropriation "Operating expenses" for capital equipment. This change will permit payment of the unpaid obligations, as of June 30, 1963, for this equipment from this appropriation.

6. "Provided further, That the *unexpended balance as of June 30, 1963, of the appropriation 'Plant acquisition and construction' shall be merged with this appropriation*".

This change provides for merging the unexpended balance as of June 30, 1963, of the former appropriation with the funds to be appropriated in this appropriation.

7. "Provided further, That *not to exceed \$30,000,000 for a spectral shift power reactor may be transferred from this appropriation to the appropriation for 'Operating expenses', if the Commission determines such transfer to be necessary to carry out such cooperative power reactor demonstration program as may be authorized by law.*"

This change provides for the transfer of funds for the spectral shift power reactor to the "Operating expenses" appropriation if the Commission is able to enter into a cooperative arrangement whereby the Commission's participation would be research and development assistance and possibly design assistance, rather than direct Government construction of the reactor.

APPROPRIATION REQUEST

Senator HILL. You may proceed, if you will.

Dr. SEABORG. Mr. Chairman and members of the committee, I am pleased to appear once again before your committee to discuss the Atomic Energy Commission's programs and budget estimates for fiscal year 1964.

As you know, we do not have as yet a bill passed by the House. I understand floor action will take place today. However, we do have the House Appropriations Committee report which would provide fiscal year 1964 appropriations for the Atomic Energy Commission in the amount of \$2,688,169,000 or a reduction of \$161,476,000 from the amount included in the President's budget.

While I will discuss these specific reductions as I highlight the programs and budget amounts for the Atomic Energy Commission for the fiscal year 1964, I would like to make this general observation. Some of the reductions, particularly in the research and development programs of the Commission, would most severely limit the Commission's ability to meet its responsibilities to advance nuclear technology and research in the physical and life sciences and the peaceful uses of atomic energy. We have submitted to your committee our comments directed toward the specific reduction proposed by the House committee and our proposed restorations. The remarks I make in this statement regarding these reductions are in the interest of emphasizing and lending additional support to the written justification material we have provided you.

BLANKET RESTORATION NOT REQUESTED

As you will note, we have been selective in determining which of the reductions we would appeal. We have not requested a blanket restoration. We note that in a number of instances the House reductions were based, in part, on the fact that for the first part of this fiscal year, the Commission has been operating under the terms of the continuing resolution which precluded program increases or the start of new programs.

Senator HILL. Doctor, if I may interrupt there, I think they made an across-the-board reduction, didn't they, on that basis?

Dr. SEABORG. Yes, they did.

Senator HILL. Everything in the public works bill.

Dr. SEABORG. Yes.

Senator HILL. Is that correct?

Dr. SEABORG. With the exception of the weapons part of our program.

Senator HILL. Except for the weapons?

REDUCTION IN FUND REQUIREMENTS

Dr. SEABORG. Yes. And, as I will indicate later on, this may not be too relevant to some of our program because the spending was programed for the second half of the fiscal year.

In some instances, this delay in appropriations has reduced our fund requirements, and we have so recognized in the amounts we are not requesting to be restored. The Commission has for a number of years received its appropriations late in the fiscal year. Our estimates have contemplated in many instances that program increases would take place in the last half of the fiscal year, thereby minimizing the effect delayed appropriations would have on the amount of our budget request.

At this point I should like to touch briefly on the major program activities and budget estimates for those activities for fiscal year 1964.

RAW MATERIALS PROGRAM

The Commission's estimate of \$324.8 million for the raw materials program would provide for deliveries of 18,537 tons of uranium concentrates. This estimate is \$153.8 million less than the costs we incurred for this program in 1963 when deliveries were 26,982 tons.

The deliveries estimated for 1964 would be made under current procurement contracts after giving effect to our estimate of the results of the stretchout of domestic procurement announced by the Commission in November of 1962. The stretchout program provides for the extension of contracts previously scheduled for completion by December 31, 1966, for those producers who agree to defer a portion of the pre-1967 deliveries until the 1967-68 time period. In consideration of this deferral, the Commission will agree to purchase in 1969 and 1970 quantities of concentrates equal to the amount deferred. It is expected that this stretchout program will result in a deferral of about 15,000 tons of material which otherwise would have been delivered prior to December 1966.

However, negotiations in this regard are still going on. Depending upon the outcome of these negotiations, it may well be that the amount allowed by the House committee, some \$4.8 million below our estimate, will prove insufficient. We are not appealing the House committee reduction, but in the event concentrate deliveries this year should require more funds, the Commission will have to reprogram its available funds to cover this need.

Senator PASTORE. How would that happen, Doctor? Do you mean if we were able to negotiate a stretchout, that our obligation, our current obligation, would become a little more severe, and that if we were able to negotiate the stretchout comfortably, we could live within the reduction of \$4.8 million? Is that it?

Mr. LUEDECKE. That is correct. If we are able to negotiate the kind of stretchout we anticipate, we believe this will be adequate. If we fail to reach the amount of deferred tonnage, it is possible then that we couldn't cover the deliveries we would have to take under contract.

(Discussion off the record.)

SPECIAL NUCLEAR MATERIALS PROGRAM

Dr. SEABORG. Operating costs in the amount of \$480.5 million are included in the Commission's budget request for this fiscal year to finance the production of special nuclear and other special materials required in the Atomic Energy Commission's programs. This amount covers the costs of operating the major production facilities for the enrichment of uranium at Oak Ridge, Tenn., Paducah, Ky., and Portsmouth, Ohio, and for the production of plutonium and tritium at Hanford, Wash., and Savannah River, S.C. These products are the special nuclear materials for our nuclear weapons and nuclear reactors for military and civilian uses.

The House committee allowance would reduce the Commission's estimate by \$5.5 million. We are not requesting restoration of this reduction. We believe that on the basis of our recent production cost experience and anticipated future cost trends, the Commission will be able to carry out this program within the amount provided in the House committee allowance.

WEAPONS PROGRAM

Fiscal year 1964 costs for this program, now estimated at \$783 million, reflect program actions recently taken by the Commission in keeping with the safeguard commitments under the Nuclear Test Ban Treaty. Funds were recently reprogrammed to provide a more intensive rate of underground testing and to maintain a readiness capability to resume atmospheric testing in the event the treaty is abrogated. Also included in the estimate for the weapons program, are the costs incurred for the production of nuclear weapons and for the conduct of research and development at the three major weapons laboratories—Los Alamos, Livermore, and Sandia.

Senator PASTORE. The House left that undisturbed.

Dr. SEABORG. The House left this figure undisturbed.

REACTOR DEVELOPMENT PROGRAM

The fiscal year 1964 operating costs for the reactor development program are estimated at \$530.5 million, an increase of about \$61 million over the 1963 level. It is significant to note the areas in which the major increases occur are for the nuclear rocket propulsion program, Rover, \$28 million; the development of satellite and small power sources, SNAP, \$12 million; and research in the fields of nuclear safety, \$10 million. While these activities receive the major portion of the increased funds we are requesting for fiscal year 1964, I cannot overemphasize the importance of the programs which either continue at essentially the 1963 level or which were allowed more modest increases. These programs encompass the development of civilian power reactors, merchant ship reactors, propulsion reactors for naval vessels, the development of transportable and mobile reactors under the Army reactors program, and the continuing quest for improved and new technology under the activities for advanced reactors systems research and development and general reactor technology research.

HOUSE COMMITTEE ACTION

The House committee action would reduce our request for this program by \$33.5 million based, in major part, on the late availability of the 1964 appropriation. While there is no question that the late appropriation will delay the start or expansion of some of our proposed programs, a good portion of our planned growth in reactor development activities was scheduled for the latter part of the fiscal year, thereby serving to minimize the effect of the late appropriation on our fund requests. The Commission proposes to appeal \$25 million of the \$33.5 million reduction, thus accepting an \$8.5 million reduction in the estimate because of the late appropriation. The Commission also requests consideration by the Senate to provide \$3.5 million added by the House committee for development work on the seed and blanket civilian power reactor concept. As a result, the total restoration in operating costs we are requesting amounts to \$28.5 million.

COOPERATIVE POWER DEMONSTRATION PROGRAM

While the written justification material presented to the committee sets forth the specific program activities involved in our requested

restoration, I would like to talk to one particular element reduced by the House committee. Their action would eliminate \$3 million in operating costs and \$12 million of additional and related obligations budgeted under the selected resources program for a total of \$15 million requested by the Commission for the cooperative power demonstration program. The effect of such an elimination would be to stop all further efforts on our part to get power reactors built in cooperation with the utility industry and it would be a serious blow to our program of developing a competitive nuclear power economy. We agree that the technology for light water reactors has reached the point in development where it may not be necessary for further Government support and assistance, but our planned use for the \$15 million requested was not for light water reactors. These funds would be used to finance cooperative arrangements with manufacturers and utilities under proposals for construction of more advanced reactors—the high temperature gas cooled and sodium graphite reactors being examples.

By entering into such arrangements, it would be possible to save the Government the cost of direct Government construction of prototype reactors of the more advanced type. As was discussed in detail in our report to the President last year, light-water reactors may not be able to meet the competition in large segments of the Nation, and as a result there is a need for more efficient, lower cost systems to make more effective use of our natural resources. It is these systems—high temperature gas-cooled or sodium graphite reactors, for example—which have not reached the point of economic competitiveness, but which are key links in our overall program for competitive power, which would be built under a cooperative program with utilities. Thus, by this means we would be meeting our program objectives with a minimum expenditure of Government funds in physical facilities and with a maximum participation of industry in the developmental phases of the program.

AMOUNT INVOLVED

Senator PASTORE. May I interrupt, Mr. Chairman, in order to clarify some of these subjects?

Senator HILL. Certainly.

Senator PASTORE. This \$15 million, which you have been discussing, is included in the cut of \$33.5 million?

Mr. LUEDECKE. \$3 million of it.

Senator PASTORE. \$3 million of it is?

Mr. ABBADESSA. The other \$12 million is in our selected resources line. It is the total of the \$3 million in cost and the additional \$12 million, which is obligational authority not expected to be spent during the year, that gives you a total of \$15 million.

Senator PASTORE. What I am trying to ascertain for the purposes of the record, and the purposes of the conference in the event that we do decide to restore this amount, is where does that put us with this reduction? I mean does that leave this cooperative effort absolutely bare or are there funds remaining?

Do I make my point clear?

Mr. LUEDECKE. I believe so, sir.

CONTROVERSIAL AREA

Senator PASTORE. This is one of the areas that will be very controversial.

Dr. SEABORG. Yes.

Senator PASTORE. Especially in conference with the Members of the House. I understand that, maybe this is not the choice word to use, but I understand that the "cut" was more or less indiscriminate. Was any justification given for the cut?

I mean was there any reason given, that we are going too far and too fast with this, that it is no longer necessary or was it just a cut? Was any justification made by the House?

HOUSE REPORT

Mr. ABBADESSA. I can read you the House report on this subject. The total comment that they have for reactor development is:

The reduction of \$33,548,000 which the committee has made in this program includes elimination of about half of the increase requested over the 1963 fiscal level. This reduction is based on 6 months' availability of the 1964 appropriation. In addition, \$3 million budgeted for research and development and design assistance to utilities which may wish to construct power reactors has been deleted.

This is their rationale, sir:

It is the committee's opinion that continuation of this subsidy program is no longer necessary to stimulate the construction of power reactors since it has been demonstrated that they are now producing electric power at competitive cost at least in those areas of high conventional fuel costs.

INTERESTED IN MORE ADVANCED TYPES OF REACTORS

As the chairman has testified, sir, with the light-water reactors, in our high cost power areas like the Northeast and California, we are becoming competitive. However, our request is for power demonstration assistance, and we are interested in the more advanced types of reactors which are not competitive at this time.

We believe it is necessary to have this assistance in order to get industry to invest their money, and in the long run save the Government from putting money into capital assets.

Dr. SEABORG. It isn't actually true that they are now producing electric power at competitive costs. The situation is that reactors can now be designed which we expect will produce electricity at competitive costs.

Senator PASTORE. I realize that, and I am personally very much interested in this program, as you gentlemen know. I am one of those who feel that if you stop it short now, or you render it stagnant, that will make all of the money that we have spent thus far maybe a useless gesture.

NEED TO KEEP PROGRAM GOING

This is a program that has to keep going in order to prove itself out. Until you reach that point of practicability in competitiveness, but so far you have been talking in general terms.

I would like you to be a little more specific. I mean precisely what will happen and what projects will have to be abandoned in the event that this cut is sustained?

I want the record to be specific, because in conference we will have to be specific. You just can't say, well, it is going to impede the program and somebody will say, "I don't think so" and there you are.

I would like to have you tell me specifically what are the projects that we will be unable to undertake, that we are already planning to undertake in the event that this cut is not restored?

DR. SEABORG'S LETTER

Senator PASTORE. In connection with this, I would like to have included in the record at this point Dr. Seaborg's letter to me of November 19, 1963, and a memorandum prepared by the Executive Director of the Joint Committee on Atomic Energy, at my request, also dated November 19, expounding on this program.

(The letter referred to follows:)

[Memorandum]

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
November 19, 1963.

To: All committee members.

From: John T. Conway, Executive Director.

Subject: Cooperative power reactor demonstration program.

Attached is a letter from the AEC concerning the current status of the achievement of economic central station civilian nuclear power.

This letter is prompted by the recent action by the House Appropriations Committee, cutting the entire appropriation for new projects in the cooperative power reactor demonstration program. This action by the Appropriations Committee was reported to you in our memorandum of November 15.

The AEC states:

"There are several large commercial nuclear powerplants * * * now being planned for utility construction which have projected power generation costs competitive with conventional plants in areas of high fossil fuel costs; but there are no plants on the line today which are producing power competitive with conventional fuel costs."

The AEC indicates its hope that future support by the Government of water-type reactors "might be avoided." However, the AEC states that there is a need for the support of advanced reactor concepts leading to the development of breeder reactors. The AEC advocates the continued use of cooperative arrangements with manufacturers and utilities in order to carry out this development program with a "minimum of direct Government construction."

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., November 19, 1963.

HON. JOHN O. PASTORE,

Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR PASTORE: You have asked about the current status of the achievement of economic central station civilian nuclear power.

There are several large commercial nuclear powerplants employing light water moderated and cooled reactors now being planned for utility construction which have projected power generating costs competitive with conventional plants in areas of high fossil fuel costs; but there are no plants on the line today which are producing power competitive with conventional fuel costs.

It is our belief, however, that the technology of light water reactors, such as are now being built, has reached the point of development where they can be expected to be economically competitive in large sizes in some high-cost areas. It is to be hoped that subsequent continued improvement of light water power reactors by industry will result in their economic application to broader geographic areas than those of the highest fossil fuel costs, and that further support by the Government might be avoided. It is to be noted, however, that the economics of such plants have not yet been demonstrated, that there is a lack of long-term experience in their construction and operation, and that there is financial risk to

the utilities in undertaking the projects particularly in the economics of the nuclear fuel cycle.

There is a need for the support of advanced converter reactor concepts. The development of such concepts is a logical step in the realization of breeder reactors, which is the ultimate objective of our long-term program. The development of breeder reactors will permit the addition of a virtually unlimited source of economic energy.

We should try to carry out this logical development with a minimum of direct Government construction. This can best be accomplished by entering into cooperative arrangements with manufacturers and utilities for the construction and operation of more advanced converter reactors. In this way, the goals of better fuel economy and more efficient utilization of our nuclear materials resources can be realized at a lower net cost to the Government.

Sincerely yours,

GLENN T. SEABORG.

AMOUNT PROGRAMED

Mr. ABBADessa. Dr. Pittman will talk about that, but first I will answer the question that you asked regarding whether this reduction will leave us bare from a funding point of view.

At the present time, from our funding availability from prior years, we have approximately \$21.4 million. However, at this time we have contracts in being or are negotiating contracts which the Joint Committee has authorized with the city of Los Angeles, where our estimate is \$8 million, southern California where our estimate is \$6.4 million, and Connecticut Yankee where our estimate is \$6 million, which means we have programed about \$20.4 million.

This leaves us approximately \$1 million available, and that is all.

REQUEST FOR NEW PROPOSALS

In our budget request, which is before this committee now, we have \$15 million for new proposals. That is the \$3 million in cost and \$12 million in obligational authority, and this is the \$15 million that the House committee has taken.

We also have some \$2.5 million to continue our other projects, and that money is left in the budget.

EFFECT OF \$15 MILLION REDUCTION

So, for all practical purposes, I think it would be a fair statement that if this \$15 million cut is allowed to remain, we really have no funding ability to go ahead with any of the new programs. Dr. Pittman can tell you which programs this \$15 million contemplated and which we would not be able to do.

Senator PASTORE. Is it all right to have Dr. Pittman discuss that at this point?

Senator HILL. Certainly.

Dr. PITTMAN. Mr. Pastore, Mr. Hill, the lack of any available funds to carry on a further demonstration program would mean we would not be able to consider proposals that we expect to get from such people as Rochester Gas & Electric, for instance, who are right now considering proposals from the industry for various types of high-temperature advance reactor systems. We would not be able to consider a proposal which we expect to get within the next year or year and a half from the ESADA group, which is a group of New York utilities also looking for the construction of a reactor an advanced type.

Although we don't know that there is going to be a specific proposal right now, if a proposal resulted from the discussion going on with the California Water Authority for the construction of reactors to move water over to Tehachapi Pass—and furnish the power of 1,000 megawatts—we would not be able to consider it.

It is the advanced type of reactors that would be affected by the budget we are talking about.

Under no conditions would we be able to even consider such proposals because there would be absolutely no funding available for these except the uncommitted \$1 million Mr. Abbadessa mentioned.

Dr. SEABORG. Isn't there a group, also, in Nevada, the Sierra Pacific group?

Dr. PITTMAN. There is a group in Nevada, the Sierra Pacific Power Co. in Nevada, considering a reactor. The reason I didn't mention that is because they are considering a spectral shift reactor which is a reactor in our program.

Dr. SEABORG. It hasn't been refined to that extent.

Dr. PITTMAN. As a matter of fact, other groups are looking at the spectral shift reactor.

Since there is only one spectral shift reactor authorized we might expect a proposal from these other groups at a later date for other systems.

UTILITY COMPANIES INTERESTED IN COOPERATING

The point is that there are at least a half dozen utility companies seriously interested in cooperating with us in the construction of these advanced-type reactors under conditions where we would not have the funds for the facilities, and it would be to our advantage, as well as to the advantage of the utilities, for us to have the funds available.

Senator PASTORE. Can you enter these negotiations or discuss these proposals without having money appropriated?

That question would be thrown at us, and I think the record has to be clear on that point.

Dr. PITTMAN. No, sir. If there is a lack of funds, I feel it would be unfair to proposers for me to give them any encouragement about the possibility of us considering the proposals. We do have, as you know, in the authorization bill, the authority to carry on this, but without the funding I would feel we are in no position to seriously discuss with these people the construction of reactors—whether they would build reactors and we, in turn, would carry out the developments.

DOLLAR EXPENDITURES

Senator PASTORE. There would be no money commitments much before July 1, 1964, would there?

Dr. PITTMAN. If we entered into any kind of discussions now, the commitments, the actual dollar expenditures in fiscal year 1964, could be \$3 million.

Mr. ABBADESSA. That is why we only show \$3 million in costs.

Dr. PITTMAN. We can't enter into it unless we have the full funding available to us.

Senator PASTORE. Why can't you?

Mr. CORSO. We have to obligate those dollars, sir, when we sign the contracts to assure that we can make good on the Government commitment.

SIGNING OF CONTRACTS

Senator PASTORE. And these contracts will be signed if these negotiations are successful before July 1, 1964?

Dr. PITTMAN. We hope so, yes, sir; at least on one and possibly on two of them.

Senator PASTORE. So the failure to appropriate this money will mean that all these other proposals will be foreclosed?

Dr. PITTMAN. That is right, sir.

There will be no more cooperative ventures beyond those that are now underway until we get further funding.

Senator PASTORE. That accounts for the \$15 million.

What are you doing about the \$33,548,000 in which this is included? Is this all you are asking for restoration?

RESTORATION REQUESTED

Mr. LUEDECKE. No, we are asking for restoration of \$28.5 million.

Senator PASTORE. What are you going to do with the balance of the money?

Dr. PITTMAN. The House appropriation, in making the cut, made an across-the-board cut of \$33 million and, in addition, suggested that we absorb the \$3½ million extra that Admiral Rickover needs for his seed and blanket development program. That made a total of roughly \$37 million that was cut across the board.

USE OF FUNDS

Of the \$28.5 million that we are asking to be returned to the budget, \$3½ million would go to Admiral Rickover's program for the continuation of the seed and blanket studies that have been underway, as you know, for a couple of years.

The remaining \$25 million would be reapplied across the board to the entire program.

What it would amount to is we would take an \$8½ million cut across the board, and we have not at this moment worked out the details of where that cut would be taken.

ALLOCATION OF HOUSE CUT

Mr. ABBADESSA. We would have to take the House cut primarily against three of our more important and expanding programs. They are covered in the first part of the Chairman's statement, and include the Rover program for nuclear rocket propulsion, the SNAP program for the development of satellite and small power sources, and the very important program for research on nuclear safety.

Our cuts would have to be taken primarily in those three programs because those are the three programs in our reactor development division that show the major growth. The House cut, in effect, eliminates about 50 percent of our requested increase.

Dr. PITTMAN. I would like to add, sir, that in those three areas most of our planning had already indicated the increase for 1964 would be in the second half rather than in the first half of the year, so it is a difficult job to take any cut.

But the \$8 million that we are not requesting be reinstated would be applied across the board, or the large fraction of it.

WATER REACTORS

Senator PASTORE. Would you say that you presently envisage that water reactors are economically competitive?

Dr. PITTMAN. There is no economically competitive reactor on the line to date.

Senator PASTORE. I used the word "envision."

Dr. PITTMAN. I wanted to get the first statement in, though, Senator. We expect reactors now being designed for construction—with the decreased fuel cycle costs that will take place over their lifetime in the areas where they are built, which are high cost fuel areas—to produce competitive power.

QUESTION THE NEED FOR ADVANCED REACTORS

Senator PASTORE. If that is true, then why do we need these advanced reactors?

Dr. PITTMAN. There are two reasons we need advanced reactors, sir. One is that the water reactors as of today, as we envision it, can be competitive only in the high-cost areas. We cannot assure ourselves that the improvements in water reactors are going to make them competitive in low-cost areas of the country and, therefore, spread the benefits of nuclear energy. The reason, therefore, that we want to develop the improved reactor is to make it possible to have competitive power in other areas.

Now, another reason we want to develop advanced reactors is that the water reactors are not the best reactors for utilizing the raw materials that we dig out of the ground. They have a low conversion ratio compared to some of the advanced high-conversion-ratio reactors. We would like to develop economically competitive reactors that utilize the fuel that is in the ground a little bit better than do the water reactors to postpone the day when we will be forced to use breeder reactors. Even when we get to breeder reactors, we will still need to have the converter-type reactors.

So it isn't a short-term program we are looking at. This will go well into the next century.

Senator PASTORE. So, to sum up, the mere fact that this cut was predicated upon the length of time it has taken for the Congress to act upon these budget requests, the fact of the matter is that these requests were submitted with that in mind?

Dr. PITTMAN. Absolutely, Senator.

NEED FOR FUNDS

Senator PASTORE. And, furthermore, much of the \$15 million included in this \$28.5 million for restoration is money that became obligated at the time that these proposals, agreements, are consummated?

Dr. PITTMAN. The whole amount becomes obligated.

Senator PASTORE. When you do that in October and April you are up against a proposition that you need the appropriated funds before they can be obligated?

Dr. PITTMAN. That is right, sir.

Dr. Seaborg. I might make one more point about the need for this \$15 million. These reactors are also a sort of bridge, a proving

ground toward the ultimate attainment of the breeder reactors, and this is another consideration.

Dr. PITTMAN. That is using the sodium technology. We will be developing intermediate reactors which need sodium technology that will be of use for fast breeders. The \$12 million that we mentioned is not part of the \$28 million. That is added.

Dr. SEABORG. \$12 million.

Senator PASTORE. It is not part of that?

Dr. PITTMAN. No, sir. The \$3 million is however.

EFFECT OF CUT ON OVERALL PROGRAM

Senator PASTORE. So, psychologically, and as a practical proposition, if this cut is made at this time, what would it do to the overall program?

Dr. SEABORG. It would drag it to a halt, stop it.

Senator HILL. It would just stop this program?

Dr. SEABORG. This cooperative program, which, in a sense, is the pay-off for the whole program that we have spent a considerable amount of money on because of its promise in the past.

Senator HILL. I think one of the best points you have made here, too, is this. When you made out this budget, requested this money, you contemplated that a large part of it would be used, say, from January 1 to July 1. Is that correct?

Dr. SEABORG. Yes.

Senator HILL. When you think of making a reduction, it is the idea that you didn't get your first 6 months, it simply doesn't fit this particular situation.

Dr. SEABORG. No. That only applies to a small part of it.

BREAKDOWN OF PROJECTS

Senator BIBLE. Mr. Chairman, in line with that question which you just asked Dr. Seaborg—do you have a breakdown showing us or showing the committee how that is programmed? Most of it comes between January 1, 1964, and July 1, 1964?

Dr. SEABORG. Yes, we have.

Senator BIBLE. It didn't seem to be in your statement except as a conclusion.

Dr. SEABORG. I said in my statement that only \$8½ million of it would not be in the category of obligating in the second half of the year. In other words, the principle of reducing—

Senator BIBLE. This is why you asked for \$28½ million instead of \$33½ million?

Dr. SEABORG. That is right.

Senator BIBLE. But I mean do you have the programs of the individual advance reactors that figure in the \$15?

Dr. SEABORG. Yes, we do. That is a program, a time schedule that we would like to apply there.

Senator BIBLE. That is before the committee, the time schedule?

Dr. PITTMAN. That has been submitted to the committee in the form of a breakdown of the various projects that would come in mostly in the second half. That has been submitted, sir.

Senator BIBLE. Thank you very much, Dr. Pittman.

HALTING OF PROGRAM

As I understand it, then, if you were not to receive this \$15 million for the advanced reactors, this program would grind to a halt. You would simply be back to the Congress asking for the same program in the next few months because you are convinced that this is a necessary part of developing the overall cooperative reactor partnership?

Dr. PITTMAN. That is right, sir. The cooperative effort with the utility and the equipment manufacturing industry will stop now if we don't get this money. It stops at a time when we have gotten our whole program to the point where the "proof-of-the-pudding" is in the utilities coming into this program and using these reactors. The only way we can get them to use these advanced reactors is to do it on a cooperative venture, because the advanced reactors have not yet gotten to the point where they are quite economically competitive, so it is a very crucial period in our whole development of civilian nuclear power.

SIERRA PACIFIC POWER

Senator BIBLE. I want to just finish my thought there.

I am aware of the interest that one of our principal private utilities in the State of Nevada has in this program, and that is Sierra Pacific Power, which was alluded to by Dr. Seaborg. I know they have spent many, many man-hours at work in an attempt to work out a proposal that could be helpful in an area where there is no further hydroelectric power and there simply is no other sources for power other than this proposed atomic reactor, and in that respect this would certainly be a very disappointing development because they press along in this direction and are hopeful that they can work out something.

So I would see nothing whatever to be gained, Mr. Chairman, by delaying this for a matter of 6, 7, or 8 months. It seems to me it would be a real blow.

Dr. SEABORG. The Sierra Pacific people came to Washington and had an interesting conference—

Senator BIBLE. So I am advised.

Dr. SEABORG. With the Commission on their interest. It is a very considerable interest.

Senator BIBLE. It is a very acute and live interest, and they are prepared to go forward in at least the exploratory stages.

I can't see what would be gained by completely cutting this off for, say, a period of a year.

BREEDER TYPES

Senator PASTORE. Are these advanced types that we are talking about, are they to do with breeder types?

Dr. SEABORG. Yes. Some of them are steps on the road to breeder types. The sodium cooled graphite reactor is an advanced converter, but much of the technology that would be learned about handling sodium for cooling would apply to the breeders that use sodium for cooling, and that is a broad area of the breeder technology.

Senator PASTORE. You know this and others know it, but for the purpose of the record the breeder type is the reactor that produces more fuel than it consumes.

Dr. SEABORG. That is right, and hence uses all of the raw material, all of the uranium, or all of the thorium.

CONTRIBUTION BY INDUSTRY

Mr. ABBADESSA. Mr. Chairman, could I make one point that is very important?

We have continually referred to this as a cooperative arrangement. I think it is important to realize that this \$15 million doesn't represent the Government spending all the money for the reactors. Industry puts in a large portion of the money. For instance, in the three most recent projects, southern California, the city of Los Angeles, and Connecticut Yankee, we are using our money for assistance, primarily design assistance. In Connecticut Yankee we are putting in about \$6 million, but they are putting in between \$60 and \$70 million. Our contribution represents about 10 percent. They are actually building the reactor and the generating facilities, so when you look at the \$15 million, in conjunction with industry expenditures, it is really a much larger amount of money that is being put into the program, and it is a case where the Government puts in less than private industry as of this stage. I think this might be important in your deliberations.

Senator PASTORE. But you have already got the money for the Yankee and for the city of Los Angeles. The point you are making is that this other money will be used more or less along the same formula.

AMOUNT OF GOVERNMENTAL ASSISTANCE

Dr. SEABORG. I think Mr. Abbadessa is making the point that the governmental assistance here is a fraction of the total cost, 15 percent or so, perhaps.

Senator PASTORE. And without it the whole program falls on its face.

Dr. SEABORG. Without it these three reactors that he referred to, the Southern California Edison and the Los Angeles Power & Light and the Connecticut Yankee would not have been built or would not now be under planning for building.

They, of course, haven't been built yet.

Senator HILL. I take it from what you said Federal funds are absolutely essential to go forward?

Dr. SEABORG. Yes, sir.

SCIENTIFIC KNOWLEDGE AND LEADERSHIP

Senator HILL. But perhaps we might say that the greater contribution you make is in your scientific knowledge in advice and counsel and the leadership you provide, is that correct?

Dr. SEABORG. Yes, we make a great contribution there because of the large program on reactor technology that the Commission has carried on over the years. The utilities look to us for the development of the type, and at a certain stage when it has neared final development, they are ready to build a particular reactor with this cooperative arrangement under which the Commission then provides a small fraction of the cost.

Senator HILL. Any other questions on this?

All right, Doctor.

Dr. SEABORG. All right.

PHYSICAL RESEARCH PROGRAM

The estimate for this program amounts to \$219 million or about \$36 million over fiscal year 1963. Almost \$17 million of this increase is for research in high-energy physics. In this field, two new major accelerators—one at Cambridge, Mass., and one at Princeton, N.J.—have been put into full operation during the past year and major modifications to the bevatron at Berkeley, Calif., have been completed. I am also pleased to state that a short time ago the new 12.5 bev zero gradient synchrotron (ZGS), at Argonne National Laboratory started operations. With the start of this machine, the Commission now has eight major high-energy accelerators in operation.

I will have the pleasure of going to Chicago on December 4 to help dedicate the ZGS, and I will go to Princeton on December 7 to help dedicate the proton accelerator at Princeton.

As important as high-energy physics is, I would not want this committee to lose sight of the very excellent research I believe we are performing in the other physical sciences, including our low-energy physics program, and our chemistry and materials research activities.

I believe I have emphasized this each time that I have appeared before your committee, Mr. Chairman.

CONTROLLED THERMONUCLEAR RESEARCH

I also believe the research we are doing in the field of controlled thermonuclear reactions will prove to be most rewarding.

I would like to stop for a moment and say something about this, because we are apparently beginning to near the point of important breakthroughs in this field.

Just before I came here this morning, Dr. John Foster, who is the Director of the Livermore Laboratory, and Dr. Chester Van Atta, and Dr. Richard Post, who has the more direct responsibility for the thermonuclear reactions research at Livermore, came in to see me in my office to tell me about some exciting results that they are now obtaining. They have devised a containment method which seems to be very successful whereby they have two coils with opposing magnetic fields which gives rise to an annular space of minimum magnetic field between the two coils so that the magnetic field is increasing in all directions from this annulus, from this donut. This is exactly what we have been searching for all these years, because this makes it possible to confine this plasma in a region where it is stable, where the field is increasing at all times so that it contains it in this annulus, in this donut.

They feel with this it will be possible to get much longer confinement times than have been possible in the past.

Using a principle similar to this, but not as good, Soviet scientists have increased confinement times by a thousandfold within the last year or two. This was an apparatus that I saw when I visited the Soviet Union.

So we are on the threshold of a breakthrough here. And it would be ironical and unfortunate if just as we reach this point we fail to go ahead with it, whereas the Soviets and the others recognize the

importance of it, and begin to put increased emphasis on it at this time, which they are, by the way.

With respect to this research, it would be most unfortunate if the Commission were forced to eliminate, at this point in time, one of the research approaches to the controlled thermonuclear program as recommended by the House committee. It is premature to make an informed judgment at this time regarding which of the several alternatives should be eliminated. The Commission expects to have enough research behind it in 2 years to be able to make concept selections.

The amount of \$3,750,000 was earmarked by the House committee as the reduction related to this program, and we are requesting restoration of this full amount.

OTHER RESEARCH PROGRAMS

The House committee would reduce the other activities of the physical research program by \$23,190,000 on the basis of holding these activities to the fiscal year 1963 level with the exception of high-energy physics which is allowed some growth. If one assumes that the basis for the increase allowed for high-energy physics was to permit operation of new facilities on which construction has recently been completed, I would point out that we have a comparable basis for increases in the other activities of the physical research program. For example, under the programs of low-energy physics, mathematics, chemistry, and metallurgy, we will have coming into operation such major research tools as the Ames research reactor, the Brookhaven high-flux beam reactor, the Oak Ridge high-flux isotope reactor, and the LRL Berkeley 88-inch cyclotron. These facilities represent an investment of tens of millions of dollars. Under the budgetary restrictions of the House committee allowance, the effective utilization of these facilities would not be possible. However, in recognition of delays occasioned by the late appropriation, we are not requesting full restoration. We have estimated that the amount provided by the House committee report for other than the Sherwood programs should be increased \$20,250,000.

RESEARCH PROGRAM REDUCTION

This amount together with the Sherwood restoration would total \$24 million which we believe should be added to the House committee allowance for this program.

Senator PASTORE. What did they cut you?

Mr. CORSO. \$26,940,000.

Senator PASTORE. You are asking for \$24 million?

Mr. CORSO. Yes, sir.

BIOLOGY AND MEDICINE PROGRAM

Dr. SEABORG. Operating costs for the biology and medicine program in fiscal year 1964 are estimated by the Commission at almost \$77 million, an increase of about \$8 million over the amount budgeted for fiscal year 1963. It is my judgment that the medical and biological research we are conducting in the field of radiation is among the most important being conducted in the life sciences in the world today.

It is vital that we improve our knowledge and understanding of these fields of science which can so profoundly affect future developments in other fields ranging from the development of nuclear weapons, nuclear explosive devices for peaceful uses, the development of civilian and military reactors, to the use of radioactive isotopes in industry, agriculture, and medicine.

With the demands for knowledge so urgent in this field of science, I am most concerned with the effect the proposed House committee reduction of over \$8 million might have on our research progress. Certainly there will be some savings because of the delay in the appropriations, but at most this would amount to slightly over \$1 million. I would also add that the Commission pursues and will continue to pursue a policy of a high degree of selectivity in approving research project proposals to assure the selection of those which will make the greatest contribution to the programs of the Commission. In keeping with the urgency of this program, we are requesting that \$7 million of the proposed reduction of \$8,328,000 in this program be restored by the Senate.

INTERESTING PROGRAMS

I might say that there are some very interesting programs here in biology; programs on the mechanism of the inducing of cancer, for example, where some important progress has been recently made at the Oak Ridge Laboratory; and other programs in the field of biology and medicine, from extension of life in general to the study of the mechanisms of various diseases, in addition to studies on the effect of radiation, and I think it would be too bad if this were cut down.

I don't know whether you want us to say something about that program.

NEED FOR INCREASE OVER 1963 APPROPRIATION

Senator PASTORE. Before you do, may I ask a question to get an answer on the record?

Apparently the House gave you the same figure that they gave you last year?

Dr. SEABORG. Yes.

Senator PASTORE. Now, what have you got to answer to that? This was important last year and it was important this year.

Dr. SEABORG. Yes.

Senator PASTORE. Why do you need \$8 million more this year? That is the argument you are going to get. Explain that.

Dr. SEABORG. Yes. For one thing, of course, just to carry on last year's program will cost \$5 million more, even if we only did the same things that we did last year.

Senator PASTORE. Why? Tell us why.

Dr. SEABORG. The increased cost of carrying on research, the increased cost of facilities, the general cost of living, increased salary for the scientists and the technicians and so forth amounts to something of the order of 6 to 8 percent per year, and we know this from experience for every year since the beginning of the Atomic Energy Commission, so this doesn't amount to very much more than holding our own.

It would probably mean a couple of million dollars expansion on a highly selective basis in areas that have shown some of this promise that I have alluded to.

Senator PASTORE. I think that answers my question.

Dr. SEABORG. Do you want to add anything to that, Dr. Dunham?

Dr. DUNHAM. I will be glad to answer any questions.

Dr. SEABORG. Maybe you might say something about that program in Oak Ridge.

Mr. ABBADESSA. Also, the Livermore program is a new program.

ARGUMENT IN CONFERENCE

Senator PASTORE. In conference you will be beset with the argument we gave you the same amount this year.

It is a good program. It is an important program. It was good last year. It still is good this year. We are giving you the same amount of money this year as we did last year.

Now, I would like to know the rebuttal to that.

Dr. DUNHAM. The rebuttal is a twofold rebuttal. One, we have come into new facilities which will make the increased cost of utilizing them about \$2 to \$2½ million. There is the cost of living, and finally, there is the new program, intensification of effort in the field of the understanding of the production, transport and eventual dissemination of fallout from nuclear weapons and from the Plowshare program, the peaceful uses of nuclear energy.

Senator PASTORE. Which we did not have in last year's budget?

Dr. DUNHAM. We did not have this in last year's budget, and we would like to be able to spend about \$2 million operating funds on that program this year.

Senator PASTORE. No. 1, if the House cut is sustained, you will have to abandon that program, either that or take it out of other programs?

Dr. DUNHAM. I don't think we can. We will have to take it out of somebody else's hide. As I think we indicated in one of our statements, last year we scanned our program very carefully and we eliminated about \$2 million worth of offsite activity, and I don't know how much of that sort of thing we can do regularly.

Senator PASTORE. In other words, with this expansion and the cut of \$8 million, if that cut is sustained, you really would have to contract your activities?

Dr. DUNHAM. Definitely would have to back up; definitely.

PROGRAM AT OAK RIDGE

Now, as to the program at Oak Ridge, we have a joint activity with the National Cancer Institute of two types. One, making available some of the talents there in the study of chemical and radiation carcinogens. Another rather fascinating development is that one of the biologists there has modified the gas centrifuge in such a way that he can get out of human white cells virus particles in patients with leukemia, in over 80 percent of the cases. This is a very important breakthrough, and the effort is jointly supported by AEC and by the Cancer Institute. In fact, they are putting in more money than we are at this moment because they are so excited about it.

Senator HILL. I didn't get that. Will you state that again?

Senator PASTORE. I just told him this for your benefit.

Dr. SEABORG. I think this is very important. That is why I particularly wanted to mention this one. I had the opportunity of going down and looking into this program firsthand a few weeks ago, and I was very impressed by it, and also impressed by how tightly the program is funded. They cannot realize the potential if it is cut back at all; it was clear to me.

CENTRIFUGE TECHNIQUES

Mr. DUNHAM. To get back to your question, Mr. Chairman, the people at the NIH have demonstrated in experimental leukemia in mice the presence of these virus bodies, and they can with conventional centrifuge techniques concentrate them to a certain extent and transmit the disease. The question has always arisen what has this to do with human leukemia? In some human leukemia cases with conventional centrifuge techniques viruslike particles are seen. But with this new centrifuge, which was an offspring of one developed for production purposes—

Dr. SEABORG. Developed by the Atomic Energy Commission.

Dr. DUNHAM. We now can get it out of 80 percent of people with leukemia out of their white cells.

JOINT EFFORT

One of those centrifuge heads is now at the National Cancer Institute. I was over there the other day and they are very excited as they see these things come out. It is a real step forward, I think, in the cancer field, and it pleases me as a joint effort on behalf of the two agencies, and so it takes a little of the tag away from AEC of always producing something harmful to the people.

I think we are going to be helpful.

Dr. SEABORG. This was a centrifuge, an ultracentrifuge of a special kind, developed in connection with our classified weapons program, but it was known within the laboratory that this was available, and this led to this joint program with the National Institutes of Health, which we are all very excited about, but which needs at this critical stage the funding to carry it on.

GROWTH IN PROGRAM

Dr. ENGLISH. Mr. Chairman, I would like to make one more point. The problem of cost of living has been mentioned. However, during the last fiscal year in this program, and this is true, also, of other programs, there was a planned small growth, which means that the program we had going as of the end of the fiscal year was a larger program than the average during the year, so that if we are held to the same average level in 1964 it means the program must go down again. So really holding it to last year's level means a reduction in the program for this reason, too.

Senator HILL. It would completely impair the program?

Dr. ENGLISH. I think so.

TRAINING, EDUCATION, AND INFORMATION PROGRAM

Dr. SEABORG. Our 1964 budget estimate of \$17,194,000 provides for the continuation of the activities of the Commission supporting training in the nuclear sciences and engineering and the dissemination of the technical information reflecting the results of the Commission's research and development activities. This amount also provides \$1,210,000 not included in the 1963 budget for preparation for a Third International Conference on Atomic Energy to be held in Geneva in the fall of 1964.

You will recall that two previous conferences were held in Geneva in 1955 and 1958.

The Commission carries out its training responsibilities by means of operating courses, and granting of fellowships, and items of equipment to qualified individuals and institutions, respectively. Our responsibilities to disseminate technical information are carried out through the support of technical publications, museums, and exhibits.

The House committee allowance of \$14,350,000 represents a reduction of \$2,844,000 to our request and would bring our program down to essentially the 1963 level. If this reduction were allowed to stand, it is obvious that we would not be able to meet our responsibilities for support of the Third International Conference to be held at Geneva and would severely curtail to a dangerous point, in my personal opinion, our ability to support essential training, educational, and informational activities. Therefore, on a selective basis, the details of which are set out in our written justification materials, the Commission is requesting restoration of \$2,400,000 of the proposed reduction of \$2,844,000.

ISOTOPES DEVELOPMENT PROGRAM

The fiscal year 1964 operating cost estimates for this program amount to \$9.3 million. I believe we have only scratched the surface in the potential exploitation of the use of radioisotopes in our commerce and industry. I am also convinced that radioisotopes have a role in space technology as a source of auxiliary power for which there exists no suitable substitute. Also, I am sure you are well familiar with the promising research we are conducting in the use of isotopes for the radiation pasteurization of food. It is most important that the Commission conduct the research and do the development work to gain the technology that will permit effective utilization of radioisotopes in these endeavors.

Therefore, I am sure you will understand my concern over the detrimental effects on the progress in this program which could result from the reductions made by the House committee. Accordingly, the Commission is proposing restoration of half of the reduction, or \$700,000. The details in support of this requested restoration are set forth in the justification material we have submitted to you.

CIVILIAN APPLICATION OF NUCLEAR EXPLOSIVES—PLOWSHARE

The Plowshare program is devoted to developing nuclear devices for scientific and excavation uses. While the \$15.1 million in operating costs budgeted for this program in fiscal year 1964 does reflect an increase of over \$5 million from the 1963 level, this increase is fully warranted by the level of experimentation which must be con-

ducted to fulfill within a reasonable time period the tremendous promise that nuclear devices have for a variety of civil applications. The budget level proposed by the House committee, a reduction of \$5 million from the estimate, would severely limit our ability to perform necessary experimental detonations and thus possibly defer indefinitely the time by which we could expect to reap the benefits of this development effort.

Senator HILL. Doctor, this program has been going on some time, hasn't it?

Dr. SEABORG. Yes. This program has been going on for about 7 years.

Senator HILL. When do you expect to have the answers?

Dr. SEABORG. We are developing the explosives that are needed, and the technology for using these explosives, on a program time schedule which could lead to a sufficient technology to dig a major canal—for example, a second canal against the Isthmus—in about 5 years.

EFFECT OF LIMITED NUCLEAR WEAPON TEST BAN TREATY

Senator HILL. You wanted to ask a question, Senator?

Senator PASTORE. Yes.

What have you got to say to the argument which was made at the time of the nuclear test ban agreement hearing to the effect that much of this work at the present time, unless an exception is worked out, would be in violation of the nuclear test ban agreement?

Dr. SEABORG. The work in fiscal years 1964 and 1965 wouldn't have this problem. This program envisages the conduct of underground nuclear tests to develop the clean nuclear explosives that are required, and certain other underground tests, and possibly some very small earthmoving experiments that would not have any chance of injecting sufficient radioactivity into the air to violate the test ban agreement.

UNDERGROUND TESTING

Senator PASTORE. Wouldn't you have about the same objective when it comes to even weapons tests underground? Do I make myself clear? You are asking for money and are receiving money for underground testing.

Dr. SEABORG. Yes.

Senator PASTORE. Now, this is part of the underground testing, too.

Dr. SEABORG. Yes.

Senator PASTORE. And the objectives are more or less the same, aren't they, insofar as these underground experiments are concerned?

Dr. SEABORG. Yes, but these are not truly weapons development experiments, these underground explosives. Sometimes they have both aspects to some extent, the development of weapons and the development of explosives that are particularly applicable to the Plowshare program. When that is the case, then we budget from both budgets, the weapons development budget and the Plowshare.

But the amount of money that we need here is required in order to conduct those experiments that are clearly Plowshare in their applications concerning the clean devices that would be used in the Plowshare experiments.

COMMITTED FUNDS—WEAPONS TESTING

Senator PASTORE. In other words, are you saying that the money that will be appropriated or is appropriated for weapons testing underground is all committed or will be committed?

Dr. SEABORG. Is all committed, is committed to testing weapons which are not suitable for the Plowshare program. So we quite carefully keep these two programs apart.

Senator PASTORE. In other words, there is no utilization you could make of that money to accomplish the objectives that you have in mind under this appropriation?

Dr. SEABORG. I would say we make the maximum utilization that we can, as long as they are weapons tests.

Obviously the weapons tests have brought us to the point we are, and have made contributions to the Plowshare program, but in addition to that we need to test devices that are oriented to the Plowshare program, and wouldn't contribute to the weapons program.

Mr. ABBADESSA. Mr. Chairman, could I clarify that? I believe our chairman is saying we make the maximum use of the technical knowledge we get out of the weapons programs. However, we cannot and would not use money that the Congress appropriated for weapons in this program to supplement this line in our budget.

PREPARATION FOR CONFERENCE

Senator PASTORE. In conference, I like to go with my strongest foot forward and I don't like to enhance a weak cause for fear that it might destroy my position on a strong one.

The point I am trying to establish here is this: I think I asked Dr. Seaborg when he appeared before our committee whether or not we had any of these projects in contemplation for at least the next 4 or 5 years, and I think your answer was in the negative.

Now, you come in here and the House has allowed you the same figure as you were granted last year, which would indicate that there is a step-up even in this, even in face of the nuclear test ban agreement.

I was wondering just how strong my position would be with reference to this as against your biology and your isotopes and your cooperative demonstration program. In other words, I am trying to get down to bare necessities on this, because I am afraid if you begin to advocate a weak cause you take the steam out of a strong one.

Dr. SEABORG. Yes. We need this to develop devices in underground explosions that will be cleaner than devices we now have, so that they can be applicable to the Plowshare excavation projects later on.

The budget is such that in order to carry on a program at the rate that we think is feasible and desirable, we need about \$15 million.

DEVELOPMENT OF FALLOUT FREE DEVICE

Senator PASTORE. Do you really seriously feel that you can develop a device that will be fallout free and not in violation of the nuclear test ban agreement to accomplish these harbors and these canals you are talking about?

Dr. SEABORG. I think that we can develop a device that will be so relatively fallout free that we could, I don't know how soon, conduct a large excavation experiment within the boundaries of the United States that would not violate the test ban treaty.

Then before we could actually use this to dig a harbor or a canal across the isthmus or what-have-you, we would have to have a modification in the treaty.

NEED FOR INCREASED BUDGET

Senator PASTORE. Now, will someone explain the step-up of \$5 million over last year?

Dr. SEABORG. I think that we have detailed figures here, but perhaps Mr. Kelly, who is in charge of the Plowshare program, could give the best explanation.

Senator HILL. Do you want to come around a little closer, Mr. Kelly?

Mr. KELLY. Maybe if I talk loud you can hear me from here.

I might point out that in fiscal year 1963 we didn't do any major experiment toward developing the application.

In fiscal year 1964 we would hope that we can do that. Also, we would hope to speed up the development of the devices that Dr. Seaborg has talked about.

There are several such projects that we know of and have been approached about.

DEVELOPMENT OF INFORMATION

Also, in these underground shots developing the devices and the small-scale experiments developing the cratering technology, we learn more about how the device interacts with the media, the rock, and that sort of thing. We are developing information that will be useful in mining and oil recovery industries. We are carrying on a number of conversations with those industries, and expect to receive within the next 12 months or so several proposals for this sort of utilization of nuclear explosives.

In addition, we are looking at some scientific applications, that is, using the very high neutron flux from nuclear explosives to make isotopes of elements that are very hard to make otherwise, that is the transuranium elements, and we have made some progress in this, and we expect to make more within the next 6 to 12 months.

BREAKDOWN ON USE OF MONEY

Dr. SEABORG. I think I can give you a breakdown.

Senator HILL. Go ahead, Doctor.

Dr. SEABORG. As an example, there is about \$4 million out of the \$14 million, it was \$15 million but this would be \$14 million, for research and development to explore these various applications of Plowshare, \$4½ million is for the testing of these devices, trying to develop a very clean device, about \$3 million is for developing cratering technology, and then about a little less than \$3 million is for such scientific experiments as the preparation of new transuranium elements and other isotopes. That is about how it adds up to \$14 million.

CRATERING

Senator BIBLE. How do you work that cratering, Doctor? Is that similar to that Sedan you had in the test site?

Dr. SEABORG. Yes, but we wouldn't be able to do it on that scale now.

Senator BIBLE. But you still can conduct it in the atmosphere? If it is kept small?

Dr. SEABORG. No, no; these would be very small shots, and in some cases even chemical explosives, but before we could conduct a large excavation experiment under the test ban we would have to have cleaner devices than we now have. That is why so small a proportion of the budget is in cratering technology in fiscal 1964.

You see, it is mostly in the other areas—development of the clean devices, and the research and development aspects of Plowshare.

OTHER TEST PROGRAMS

Senator BIBLE. Under what category does the testing which you did out at Fallon, that isn't the Plowshare program at all?

Dr. SEABORG. No, sir; Vela.

Senator BIBLE. That was the detection program?

Dr. SEABORG. Yes; that is another budget; Vela is actually in the Department of Defense, but experiments are conducted by the Atomic Energy Commission.

Senator BIBLE. Was there any fallout as a result of that?

Dr. SEABORG. No.

Senator BIBLE. Was it all contained?

Dr. SEABORG. All contained and completely contained.

All the shots that we have carried on since the test ban treaty have been, in effect, completely contained—100 percent contained.

ACTIVITIES PLANNED UNDER TREATY

Senator BIBLE. Then your response to the House statement I think it is fairly clear, but they make a point that by virtue of the test ban treaty the program will be delayed.

Dr. SEABORG. No.

Senator BIBLE. Your answer to that, straight up, is that that statement is wrong?

Dr. SEABORG. That is right; it is wrong.

Senator BIBLE. For the reasons you have given?

Dr. SEABORG. Yes.

The time when we can apply them full scale may be delayed, but the program that we have to develop them, the clean explosives, can go forward.

Senator BIBLE. You are not only delaying it, but you are increasing it again from \$10 to \$15 million?

Dr. SEABORG. Yes; and this is, of course, in part due to this emphasis on developing these clean devices. But these are devices that we would have to develop in any case, whether we had a test ban treaty or not.

We changed the order of our program a little bit because of the test ban treaty, and will develop the clean device first before we do the cratering experiments.

Senator BIBLE. But if no test ban treaty had been signed, then you would be asking for this amount of money in any event, in this particular field?

Dr. SEABORG. Yes.

Senator BIBLE. The Plowshare program?

Dr. SEABORG. Yes; we would. It would be about the same.

Senator BIBLE. Thank you, Doctor.

Thank you, Mr. Chairman.

PROGRAM DIRECTION AND ADMINISTRATION

Dr. SEABORG. That completes my outline and budget picture for the operating programs of the Commission. The funds to cover the costs of the day-to-day workload associated with the administration of the execution of these operating programs are provided under the heading "Program direction and administration." These costs estimated at \$73,415,000 in fiscal year 1964 cover the costs of salaries, travel, supplies, utilities, and so forth for the employees engaged in the direction of the Commission's operating activities as well as those employees administering the regulatory activities of the Commission.

NUMBER OF EMPLOYEES

Senator HILL. How many employees do you have to date, as a whole?

Mr. CORSO. Our employment as of October 31, 1963, was 7,048 people.

Mr. ABBADESSA. Of which, 5,462 is our planned June 30, 1964, staffing level in the "Program direction and administration" category which we have been talking about here.

Dr. SEABORG. These responsibilities are manifold and have increased in complexity in recent years and every indication leads to the conclusion that they will continue to increase in complexity in future years. The Commission has been most modest in requesting additional staff in keeping with the increased complexity and level of our activities, preferring to meet these demands by increased productivity including staff reassignments and reorganizations. However, the Commission was given approval to request in its 1964 budget an increase of 148 employees. Subsequent to that approval, as a result of the negotiation of the test ban treaty, the safeguards program was developed, and the Commission was given approval to reprogram over \$100 million for its conduct—the bulk of these funds coming from prior year unused appropriations. With the assumption of these additional safeguard responsibilities, the Commission would have been justified in requesting a commensurate increase in its staffing, but it did not do so, choosing instead, to divert the staff support for administration of this program by reassigning staff from less important activities. Therefore, the effect of the reduction proposed by the House committee in the budget estimate for program direction and administration and the commensurate reduction of 73 people from the staff request of the Commission would be doubly acute. Although we are not proposing full restoration of the proposed funds reduction, we strongly believe that the Commission's request for increased staff of 148 is necessary and should be approved. We now estimate that

this can be accomplished along with related needs in other objects of expense if \$1,355,000 of the \$1,855,000 reduction is restored.

COST OF SAFEGUARD PROGRAM

Senator PASTORE. You have connected with this restoration request with our responsibility on the safeguards?

Dr. SEABORG. We have noted that in carrying this out, which includes the expenditure of \$100 million more money than we had anticipated when the request was made originally, that we would need supervisory personnel. This would require an increase—

Senator PASTORE. This would cost you \$100 million?

Dr. SEABORG. The safeguards program will cost \$100 million, yes, and in order to supervise that, the proper spending of that, we are pointing out here that personnel are needed, and perhaps it should have been in addition to the 148 that we requested. But we would carry this on somehow, this additional supervisory responsibility, within the increase of 148.

Senator PASTORE. Where is the \$100 million that will be necessary for the safeguards?

Mr. CORSO. It is in the weapons program.

Senator PASTORE. It is in the weapons program, right?

Mr. CORSO. That is right.

Dr. SEABORG. Yes.

Senator PASTORE. This is the supervisory. In other words, this is exclusive of whatever is necessary under the weapons program?

INCREASE IN STAFFING

Mr. CORSO. This is right, sir. What the chairman is talking about is that we had permission to request an increase in staffing of 148 people in our fiscal 1964 budget. Subsequent to that approval, the safeguards program was approved.

Senator PASTORE. These 148, are they within the weapons program?

Dr. SEABORG. No; the whole Commission.

Senator PASTORE. The whole Commission?

Dr. SEABORG. And it was subsequent to that approval that the safeguards program with the additional responsibility came into being.

Senator PASTORE. And you are willing to absorb that responsibility?

Dr. SEABORG. Yes; within the 148.

Mr. CORSO. That is right.

Dr. SEABORG. I am pointing out that to go below the 148—

Senator PASTORE. By a half million dollars.

Dr. SEABORG. Would be very difficult.

POSITIONS REQUESTED

Mr. ABBADESSA. We have requested 148 positions, sir. At the time of the safeguard program, we just put in money to operate the program and did not put in any money for additional Government employment. Now, the House has come along and cut our 148 request by 73, so it really has a double effect, because we were planning to absorb the increase in our Government payroll for the safeguard program out of the original request for 148 positions.

Senator PASTORE. The point I am trying to establish, though, the personnel that you require under your weapons program, is that by contract as against this which is civil service employees which are required in the home office to see that the program is properly carried out?

Mr. ABBADESSA. That is correct, sir.

Senator PASTORE. That is what we are talking about.

Dr. SEABORG. These people, yes.

Mr. ABBADESSA. The hundred million dollars would cover hardware, contractor personnel, laboratories, and expenditures of that nature, but none of that money goes to increase the Government payroll which is in this line item. At the time that the Commission considered our test ban requirements, it realized that we would have to put some supervisory personnel on the Government payroll but the Commission did not request additional funds and planned to absorb it out of this request for 148 positions.

The House has now reduced this to 75. They cut it by 73, so that in addition to—

BUDGET BUREAU APPROVAL

Senator PASTORE. Who authorized 148? You mean you made a request for 148?

Mr. ABBADESSA. That is correct, sir.

Senator PASTORE. Nobody ever authorized 148?

Mr. CORSO. The Bureau of the Budget gave us permission to put funds in our budget for 148 additional positions in 1964.

Mr. ABBADESSA. They approved it.

Senator PASTORE. So what they actually did was cut it in two?

Mr. ABBADESSA. That is correct, sir, the committee cut it approximately in half—they gave us the plus one.

Senator PASTORE. Gave you the benefit of the doubt?

Mr. ABBADESSA. Yes, sir.

Senator PASTORE. All right, that is clear to me, and I think it is clear in the record now.

Senator HILL. Go ahead, Doctor.

CHANGES IN SELECTED RESOURCES

Dr. SEABORG. Under this heading are provided the obligations which are related to the operating costs for each of the Commission's programs I have just discussed. I already mentioned the need for restoration of the \$12 million of obligational authority that is related to the costs for proposed cooperative arrangements for the demonstration of civilian power. The Commission would propose restoration, also, of \$11 million for the obligational authority related to the other program restorations I have discussed. In summary then, of the \$25,002,000 reductions proposed by the House committee, the Commission requests restoration of a total of \$23 million.

PLANT AND CAPITAL EQUIPMENT

I would now like to summarize briefly the budget estimates for plant and capital equipment proposed for fiscal year 1964. As you know, it is under this appropriation that we budget for the construction projects for each of our major programs which are authorized

annually by the Congress. In fiscal year 1964, we are also budgeting for the capital equipment replacements, and additions to our existing plant. In prior years this latter category has been provided under our operating expenses appropriation. The justification material submitted to the committee includes a listing of all of the projects for which the Commission is requesting obligational authority and so I will not go into those specific items.

I would like to point out, however, that of the \$46,145,000 reduction proposed by the House Appropriations Committee, \$17,945,000 relates to the 12 construction projects the Commission proposes to undertake in keeping with the safeguards program under the nuclear test ban treaty.

Senator PASTORE. Can you be a little more specific on that? Precisely what?

WEAPONS PROGRAM CONSTRUCTION PROJECTS

Dr. SEABORG. Yes. We have under consideration, and we have requested authorization for 12 buildings, divided among the Livermore Weapons Laboratory, the Los Alamos Weapons Laboratory and the Sandia Weapons Laboratory, in order to strengthen these laboratories, in order to give them needed facilities in compliance with the directive by the President that these laboratories be strengthened during the test ban treaty. In order to keep these laboratories strong and healthy, we have felt that they needed these facilities. These facilities, as a matter of fact, have been long overdue in a number of cases, and we have asked the Joint Committee for authorization for these 12 buildings, and also are asking the Appropriations Committee for the funding related to these 12 buildings.

Senator PASTORE. And can you use this money and commit this money or obligate it before—

AMENDED REQUEST FOR APPROPRIATIONS

Dr. SEABORG. During fiscal 1964, that is right. The House Appropriations Committee has not yet acted on this. This came in as an amended request for appropriations. Thus, in a sense, it is not something they have cut out of our program. They haven't yet acted on it. But it is included in their total cut that we have given here.

Senator PASTORE. You mean they haven't acted on the authorization?

Dr. SEABORG. They haven't acted on the appropriation for these 12 buildings.

Senator HILL. The estimates you mean?

Dr. SEABORG. The funding.

HOUSE ACTION

Mr. CORSO. They did not include the money in their allowance on the basis that these projects were not as yet authorized.

Senator PASTORE. In other words, this is not included in the cut?

Mr. CORSO. Yes, sir, it is included in the reduction. The amount allowed by the House will not provide for the \$17,945,000 that these projects would require, on the basis that they were not as yet authorized.

Senator PASTORE. Then why do you say they haven't acted on it? Of course they have acted on it if they cut it out, haven't they? I don't follow you there.

Mr. CORSO. What the Chairman meant, they have not acted on it in the way of exercising any prejudicial attitude toward the projects. They omitted them from the allowance because they were not authorized.

PROJECTS NOT AUTHORIZED

Senator PASTORE. That is the point, they haven't been authorized.

Dr. SEABORG. They haven't been authorized. The House Appropriations Committee, as I understand it, has just set them aside. They have not been approved, pending authorization.

Senator PASTORE. But they are included in the figure that you constitute as the overall figure of the cut.

Mr. CORSO. That is right, sir.

Dr. SEABORG. They are included in the \$46,145,000 that we constitute as a cut; yes, sir.

Senator BIBLE. What is the status of the authorizing legislation? You completed your hearings before the Joint Committee on Atomic Energy; is that correct?

Dr. SEABORG. We completed those hearings.

Senator BIBLE. Was the bill reported out on the House side?

Senator PASTORE. I guess the House has a point here. It has got to be authorized before it is appropriated, and if there is any delay at all, it would be the responsibility, of course, of the Commission in bringing it up late and our responsibility in not reporting it out early. When I say our, I mean the Joint Committee.

REQUEST FOR AUTHORIZATION

Senator HILL. When did you ask for the authorization?

Dr. SEABORG. A couple of weeks ago.

Senator HILL. Just a couple of weeks ago?

Senator PASTORE. We are ready to report it out but the fact of the matter is that you might go to conference before that is done.

Dr. SEABORG. Of course, this all has developed since the signing of the test ban treaty.

Dr. ENGLISH. Or presumably they could have shown appropriations subject to authorization. But they chose to await action on the authorization.

QUESTION OF MECHANICS

Senator PASTORE. The House hadn't acted in that way. Of course if there is any excuse not to appropriate, they won't, and the authorization has been made in the past. I am getting into the mechanics not the justification. It is a question of mechanics because if we go to conference before that authorization bill is approved by the Congress and signed by the President, I don't think we will be able to recoup this money, and you might have to wait for a supplemental. That is about the size of it. That is the size of it.

That is the reason why I brought the subject up, although in the overall cut that the House made, it included this, you see.

The argument here—there is no question at all about it if the House did review this on its merits would allow it.

Dr. SEABORG. I think so, because you will recall that that was the one part of our budget, the weapons part, where they didn't make any cut at all.

Senator PASTORE. Yes.

Dr. SEABORG. The operating budget.

Senator PASTORE. All right.

Now, that is the \$17,945,000. You are going to explain the difference between that and the \$46,145,000.

OTHER CONSTRUCTION PROJECTS

Dr. SEABORG. Yes.

The funding for these projects was excluded from the House committee allowance on the basis that they were not as yet authorized. I am hopeful that the authorization action will take place in the near future and that the Senate will provide the associated funding. I should like also to mention the other specific reductions proposed by the House Appropriations Committee of \$250,000 for the Puerto Rico Nuclear Center and \$750,000 for the county building at Los Alamos, N. Mex. The Puerto Rico Nuclear Center construction amount is necessary to provide alterations and additions to the research and training facilities at both the Mayaguez and Rio Piedras locations. The major portion of this amount—\$150,000—will be used for a shop building at the Mayaguez campus. This is needed to carry on effectively our training mission at this location. The amount for the county building at Los Alamos is in keeping with the Community Disposal Act provisions to turn over to Los Alamos, when it assumes the responsibility of self-government, facilities in good condition to house municipal functions. We are progressing in our endeavor to convert Los Alamos into an independent, self-governing community rather than a Federal town, and in my view it would be most unfortunate if this progress were to be curtailed because of the deferral of this facility. The estimated cost of this building has been reviewed intensively and in our view an adequate facility could not be provided at a reduced estimate.

COMMUNITY BUILDING IN LOS ALAMOS

Senator BIBLE. On that point, Doctor, because the House comments on that rather emphatically, I am wondering if there are more supporting arguments than that. It says it includes \$750,000 programed for community building in Los Alamos.

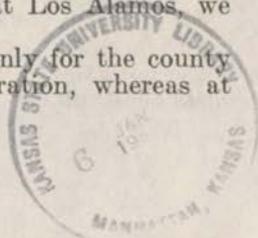
The committee would be glad to consider funding of such a building, but it is convinced that an adequate facility can be provided at a lower cost.

You are convinced it cannot be provided at a lower cost?

Dr. SEABORG. General Betts, do you want to speak to that?

General BETTS. I think the thing we can say about that, Senator Bible, is that we have had the experience of going through a disposal activity for the community at Oak Ridge and the community at Richland, both of which were provided community buildings in the course of that disposal procedure. In looking at Los Alamos, we have one difference.

That is, that Los Alamos has to provide not only for the county administration but also the municipal administration, whereas at



Richland and at Oak Ridge it was only the municipal administration that they had to provide for.

We take those into account and we find that the Los Alamos building is about 20 percent larger in terms of available square footage.

Now, if we accept that as a bona fide requirement, we find out that the costs come out about the same for the building proposed at Los Alamos, taking into account the increased construction costs that have occurred since 1956 when the other buildings were provided.

SIZE OF BUILDING

Senator BIBLE. How large a building is it?

General BETTS. It comes out to about 37,000 square feet, sir.

Senator BIBLE. Is that detail in the record? I assume it is.

General BETTS. We have that in the backup papers, I am sure; yes, in the construction.

Senator BIBLE. How many square feet, again?

General BETTS. 37,000, sir.

Senator BIBLE. 37,000 square feet at a cost of \$750,000?

General BETTS. This total cost here will include some other costs, engineering, and site preparation besides just the square footage of the building.

COST FIGURES

Senator BIBLE. Were the details of the cost given to the House committee?

General BETTS. The building costs out at \$16 a square foot.

Senator BIBLE. \$16 a square foot?

General BETTS. Yes, sir; and that is a very reasonable cost, it seems to me, for a remote site such as Los Alamos.

Senator BIBLE. Does this compare with other cost figures you have had in recent years?

General BETTS. That figure comes from our experience in the Los Alamos area on other construction.

Senator BIBLE. It will average out at \$16 a square foot for a comparable building within the last couple or 3 years at Los Alamos?

General BETTS. Yes, sir.

Senator BIBLE. Was all this information given to the House committee at the time you justified the \$750,000?

General BETTS. We did not discuss the size of the building in detail. I believe our reference at that time was to a facility similar to that which had been provided for Richland and Oak Ridge in the course of those disposal activities.

Senator BIBLE. I was just attempting, Mr. Chairman, to build into the record substantiation for the building of this size at a cost of \$750,000.

The House report is very clear that they feel that they could have an adequate facility, I assume that would be a smaller facility, at a lower cost.

DUAL USE OF BUILDING

Senator PASTORE. Is it your understanding, General Betts, that there is a misunderstanding on the part of the House that this was to house both the county and the municipal agencies? I mean, this is a guess that you are making?

General BETTS. This may well be the case. I don't know because we did not discuss this with them in terms other than that we would have to provide a facility of this nature.

I don't believe we went into this difference in the governmental construction.

Senator PASTORE. In other words, this comparison was made on the premise of other buildings which did not have to house both these two complexes.

General BETTS. I am making that as an assumption, Senator Pastore. I did not discuss this subject with the House committee.

Senator PASTORE. Where are these activities housed now at Los Alamos?

General BETTS. What activities are now going on in Los Alamos pertaining to the county and municipal administration—

Senator PASTORE. That is right, that need new housing—

SAVING TO TAXPAYER

General BETTS (continuing). In some old World War II wooden buildings, old converted barracks. In looking at the business of providing the community with a starting position in terms of the disposal procedures, we feel that it is appropriate to give them the same kind of capability here as was given in the Richland and Oak Ridge situations.

Senator PASTORE. Which, in the long run, means a big saving to the taxpayer.

General BETTS. It means that those communities start off with a running start and not already behind the eight ball with less than adequate facilities from which to run their government.

REVIEW OF PROJECT

Senator PASTORE. Now, have you given this a second look since the House took its action?

General BETTS. Yes, sir. We have reviewed this.

Senator PASTORE. You seem to be appealing for your original figure.

General BETTS. We went back to the Los Alamos staff, discussed this with them, discussed this within our own staff in terms of the standards against which we would measure the request, and have decided that indeed we were reasonable in our request the first time.

Senator PASTORE. The House did not cut this down. It excluded it entirely, did it not?

General BETTS. No, sir. They said they thought that a facility could be provided for somewhat lesser funds.

Senator PASTORE. So they took it all out?

Dr. SEABORG. I guess that is right.

General BETTS. That is right.

Senator PASTORE. All right.

COMPARISON WITH GSA CONSTRUCTION COSTS

Senator HILL. Tell me this: How do your costs compare with GSA construction costs?

Mr. DERRY. Very much the same, sir.

Senator HILL. About the same?

Mr. DERRY. Yes. Our jobs are designed by the same kind of organizations, that is independent architect-engineers. We take competitive bids, and we test it in the same manner they do. Our cost experiences are identical with theirs. We check very closely with both the Corps of Engineers and with the GSA in setting our cost indexes and our cost records.

OAK RIDGE BUILDING

Going back it might be pointed out that the county building at Oak Ridge cost \$500,000 in 1956. That same building today built at Los Alamos would cost \$790,000. We are talking about the same thing. Costs have gone up about 25 percent since 1955-56—everybody's construction costs, GSA as well as ours.

Senator BIBLE. What was the square feet in the Oak Ridge building as compared with Los Alamos, approximately the same?

Mr. DERRY. About 30,000 square feet, sir. Then there is another thing; the difference in cost in building at Los Alamos. It costs 25 percent more to build at Los Alamos than it does at Oak Ridge. It is simply a cost differential because of location.

Senator BIBLE. Thank you.

Senator PASTORE. If you delay this any further, the only thing is that the costs go up.

Mr. DERRY. Another 3 percent per year.

Senator HILL. All right, Doctor.

REDUCTION IN OBLIGATIONS

Dr. SEABORG. Finally, gentlemen, I would like to address myself to the reduction in obligations on the basis that there may be slippages in contracting for construction projects. I cannot deny we have encountered such slippages and I would hesitate to state that we will not in the future encounter such slippages. However, our appropriations requests and our financing plans are based on reserving for each project which the Congress approves the dollars that are necessary to obligate when we contract for the construction of that project. The reduction of \$27,950,000 proposed by the House committee would mean, in effect, that we would not have the funds in hand to contract for and construct production and developmental facilities already approved and authorized by all parties concerned. Therefore, the Commission is requesting full restoration of this reduction.

CONCLUSION

Mr. Chairman, members of the committee, this concludes my prepared statement.

RESTORATION REQUESTED

Senator HILL. Doctor, what is the overall amount that you ask be restored?

Dr. SEABORG. The sum total for the restoration?

Senator HILL. The restoration. How much of the \$161,476,000 do you request?

Mr. CORSO. \$137,200,000, sir.

Senator HILL. Your different requests as you went through these different programs adds up to that?

Mr. CORSO. Yes, sir.

Senator HILL. Senator Pastore?

Senator Bible?

Senator BIBLE. No, thank you, Mr. Chairman.

Senator HILL. Is there anything you would like to add, Doctor?

Dr. SEABORG. No, I don't believe so, unless any of the staff would like to add anything for the record.

Senator HILL. Would any of the staff like to add anything?

Dr. SEABORG. I believe not, then, thank you.

GENERAL REDUCTION

Senator PASTORE. Mr. Chairman, I think we ought to hear a little more on this slippage amount.

Dr. SEABORG. On the capital?

Senator PASTORE. Yes. What does it mean? If we don't restore this, what is the result? What do we lose?

Mr. CORSO. Sir, there is no question but that every year-end we do have some unobligated funds. But these funds are which are earmarked for particular projects.

Now, what it does mean if we do not have this amount restored is that projects which we had intended to obligate, and merely because certain phases of them did not get under contract, we would not have the funds available to let those contracts when we were ready to proceed. In the event that this restoration were not made, this would impose an additional burden on our next year's budget in which no provision is made for the particular projects that would have had the obligational authority taken from them.

SLIPPAGE

Senator PASTORE. But do you need the whole \$27,950,000?

Certainly there is going to be some slippage.

Mr. CORSO. There is no question but that there is going to be slippage, sir. It is just a question of trying to identify which projects you will not contract for on schedule, and then considering what effect this has next year when you are in a position to let the contract for that particular project—where does the money come from? This is the crux of the problem.

Senator PASTORE. Are you willing to compromise on any percentage, 5 percent, 10 percent?

There must be some leeway. Of course I realize that what you have in mind when you go to conference you end up getting half of it, if you are successful.

Mr. CORSO. The reason why it is difficult to arrive at a particular percentage is because this amount that we are requesting for the plant appropriation represents, for the most part, the sum of about 45 different line item projects that we have in the budget, and it would be very difficult to determine at this time which one or several of these items is not going to get under contract or what portion of a particular item is not going to get under contract.

Senator PASTORE. I realize that, but that is precisely why they took it out.

Mr. CORSO. Yes, sir.

Senator PASTORE. The reason why they did take \$27,950,000 out for slippage was for that reason.

Mr. CORSO. Yes, sir.

Senator PASTORE. Because you can't tell with any precision, so they gave you an overall cut. And this is the amount that they took out, and you are asking for the full amount to be restored.

Mr. CORSO. Yes, sir; because we would need the funds when we let the contracts for the projects.

Senator HILL. Any other questions?

(Discussion off the record.)

COMMUNICATIONS

Senator HILL. Are there any further questions, gentlemen?

I have three letters here addressed to Senator Hayden, the chairman of the full committee, one from our colleague, Senator Randolph, of West Virginia, and two from the National Coal Conference. If there is no objection, we will put these in the record.

(The documents referred to follow:)

NATIONAL COAL POLICY CONFERENCE, INC.
Washington, D.C., September 16, 1963.

HON. CARL HAYDEN,
Senate Office Building,
Washington, D.C.

DEAR SENATOR HAYDEN: A few days ago you received a letter which we addressed to every Member of Congress raising several pertinent questions relative to the wisdom of continued enormous Federal expenditures in an attempt to develop nuclear power to compete with coal. These subsidies become even more inexcusable in view of claims now being made by the industry that plants soon to be built will be competitive even without subsidies.

Naturally, the coal industry, which at present provides more than 200 million tons of coal annually to generate 67 percent of the Nation's steam-generated electricity, is alarmed over the threat posed by this Government subsidy to its future existence and to the 2.5 million persons dependent upon coal and allied industries for a livelihood.

In the beginning, Government subsidy for this new industry was justified on the grounds that only with Federal funds could the development of workable, practical reactors be achieved. Therefore, Congress authorized large appropriations for research and development work on reactor prototypes.

Unfortunately, the nuclear power program now has gone far beyond this original concept. Today the modified "round three" of the Atomic Energy Commission's cooperative power reactor demonstration program is concentrated, for the most part, on subsidizing the building of proven, large-scale projects to produce electricity for commercial sale, and which are economic to build only because of the size and extent of the Government subsidy. New experimental, prototype reactors are now being largely neglected.

This is happening even in the face of claims by a prominent electric utility official that nuclear plants can already compete with conventional fuel plants without subsidy. Mr. Louis H. Roddis, Jr., president of the Pennsylvania Electric Co., has stated that two commercial-size nuclear plants to be built on the east and west coasts " * * * will produce electricity at a lower unit cost than fossil-fuel plants in the same location."

In a speech entitled "Nuclear Kilowatts Become Competitive" before the electric companies' public information program in Chicago recently, Mr. Roddis contended that water-cooled reactors slated for operation in 1967-68 will be "competitive with fossil fuel at 30 cents per million B.t.u.'s, indicating that nuclear kilowatts are competitive with fossil kilowatts in approximately one-half of the United States." He stated that this cost is "on a nonsubsidized basis."

In view of such an assertion by a respected and capable leader in the utility industry, there can certainly be no justification whatsoever for any additional

expenditures of Government funds to build nuclear plants to produce power at the expense of a major existing industry.

And yet, even in the face of such claims from the industry that competitiveness has already been reached, the Atomic Energy Commission is pushing ahead with determination to see that additional large capacity nuclear plants, paid for in part by Government money and sustained in operation by Government subsidy, will be built. Dr. Glenn Seaborg, AEC Chairman, in testifying before the Joint Committee on Atomic Energy this year, declared that the AEC proposes to "stimulate and support the utility industry in the construction of 10 to 12 full-scale powerplants during the next dozen years to demonstrate the competitiveness of reactors of increasingly improved design." Please note that these reactors referred to are not experimental prototypes, which have, in the past, been the Government's justification for being in the atomic energy business in competition with private industry, but are merely larger and perhaps more efficient plants of a type already built. The only excuse used for this major continuing program is that the Government wants to prove that they can be competitive with fossil fuels—in other words that they can take over the utility market from coal.

Even if these plants fail to prove themselves competitive, it is important to recognize that they will be actual production plants, and not demonstrations, and will produce power to fill a market need which otherwise would be filled by plants burning fossil fuel. Twelve plants of about 500,000-kilowatt capacity, which is the size contemplated, would burn, during their estimated 20-year lifetime, the equivalent of 280 million tons of coal.

Many experts have predicted that by 1980 as much as 20 percent of the Nation's electric power needs will originate in nuclear plants. As the enclosed press release, which we recently issued, points out, this will be the equivalent of 190 million tons of coal annually.

The present AEC practice of subsidizing large, nonexperimental, and identical nuclear plants must be ended. The huge Government expenditures involved in the subsidies are not necessary. There is ample coal and other fossil fuels to generate increasing amounts of electricity to meet the Nation's needs for electric power. And certainly, if Mr. Roddis is correct, there can be no further justification for the Government continuing, by financial contributions, to stimulate the building of private nuclear electric plants. On behalf of the coal and allied industries, and the millions of people dependent on them, we earnestly urge you, as a Member of Congress, to oppose any further appropriations to provide subsidies for the nuclear power reactor development program, and to reject the AEC's request for an extension of time in which to accept proposals to build plants under its so-called third round program with the help of Government funds.

I would appreciate any comment you might care to make.

Sincerely,

JOSEPH E. MOODY, *President.*

[Advance release from National Coal Policy Conference, Inc., for use in morning papers of Wednesday, Sept. 11, 1963]

WASHINGTON, September 10.—Only one of the many forms of subsidy used by the Federal Government to encourage the development of a civilian nuclear power industry could have the effect of wiping out a market for 173 million tons of coal by 1980, a spokesman for the coal industry declared today.

Joseph E. Moody, president of the National Coal Policy Conference, said this one subsidy—the providing of nuclear fuel to private utilities under Government financing rather than requiring the utilities to own, process, and reprocess their own fuel under more expensive investor financing—"will have a profound effect upon the growth rate of this new industry which will compete with coal as a fuel for the generation of electricity.

"The Atomic Energy Commission has estimated that under the present Government subsidy program, nuclear power will develop to the point where it will be the source for up to 20 percent of the Nation's electricity needs by 1980," Mr. Moody declared.

"Dr. Theodore Baumeister, Stevens Professor of Mechanical Engineering at Columbia University, has estimated that this 20-percent share would be reduced to only about 2 percent if Government financing is discontinued and the utilities are required to go into the private money market to provide their own financing.

"It is easy to see what this means to the coal industry.

"By 1980, it is estimated that total consumption of electricity will amount to 3,000 billion kilowatts.

"If Government financing of nuclear fuel is continued and nuclear power meets 20 percent of this expanded requirement, as AEC predicts it will, this means a potential market for 192 million tons of coal will be replaced.

"If this Government subsidy in the form of cheap financing is removed and the nuclear power share of the market is held to 2 percent, as Dr. Baumeister believes it would be without the financing subsidy, the replacement of coal markets would be 19 million tons.

"Thus, the difference this one Government subsidy for nuclear power would make in the potential market for coal in the electric utility industry by 1980 amounts to 173 million tons."

The President of NCPC, which represents coal producing companies, the United Mine Workers of America, coal-hauling railroads, coal-consuming electric utilities and manufacturers of coal mining equipment, also pointed out that other Government subsidies used to encourage development of nuclear power in competition with private industry's fossil fuel plants include reimbursement by AEC for design costs on large, nonexperimental plants, waiver of all costs for the use of Government-owned fuel during the first 5 years of a plant's life, continued renting of Government-owned fuel at charges far below what it would cost the utility to provide its own fuel, and Government sponsored indemnity insurance at a fraction of what this insurance would cost if bought from private insurers.

"The Government has spent to date \$1.275 billion on its civilian nuclear power program and it is continuing to spend at the rate of \$216 million a year," Mr. Moody said.

"The sole purpose of these massive Government subsidies is to try to make nuclear power competitive with coal. We think it is wrong to use taxpayers' funds in this fashion.

"If nuclear power is needed, and if it can be produced economically, the necessary plants will be built by private enterprise without the necessity of vast Government subsidy.

"We have yet to see persuasive evidence that the plants are needed or can be made competitive with coal-fired plants.

"This is one vast Government expenditure that should be ended."

NATIONAL COAL POLICY CONFERENCE, INC.,
Washington, D.C., August 30, 1963.

Hon. CARL HAYDEN,
Senate Office Building, Washington, D.C.

DEAR SENATOR HAYDEN: The National Coal Policy Conference speaks for the great industrial federation built around bituminous coal—the coal-producing companies, the United Mine Workers of America, the coal-hauling railroads, coal-consuming electric utilities and manufacturers of coal mining machines and equipment. Members of this organization have invested more than \$32 billion in plants and facilities, and provide a livelihood for more than 2.5 million Americans.

We, as an organization speaking for this vital force in our economy, are deeply concerned over the civilian nuclear power program as it is presently being conducted by the Atomic Energy Commission.

The private electric utility industry is now by far the largest single market for bituminous coal. The AEC program, the heart of which is massive subsidies, is directed toward replacing coal with nuclear power as the major source of the Nation's electric power supply. If all charges of a nuclear plant are fully applied we have reason to believe that the cost of making electricity would still be higher than making it with the basic fuels in spite of Government subsidization.

Therefore, we must speak out in opposition to the expenditure of taxpayers' funds on a program which cannot be justified and which, if not checked, could very well have the ultimate effect of wiping out this great American industry to the detriment of the national security.

For some reason, this massive subsidy program has not received the attention it rightfully deserves. We respectfully ask that you keep these following considerations in mind in connection with legislation which will authorize and appropriate funds for this program:

(1) The AEC program no longer is concentrated on research and development work in connection with reactor prototypes. Rather, the chief and almost

exclusive emphasis is now upon building large-scale, identical installations in the 400- to 500-megawatt range. The AEC has made clear that without massive Government subsidies for both construction and operations these plants would not be built nor would the electricity they produce come anywhere near being competitive with coal-produced electricity even in the so-called high-fuel-cost areas.

(2) There is no present or impending shortage of electric power to justify such massive Government participation in the civilian nuclear power program. True, the consumption of electric power is expected to quadruple by the year 2000, but all evidence proves that there will be sufficient fossil fuels—particularly coal—to meet this vastly expanded need. The Geological Survey has reported that present known reserves of coal, recoverable with present techniques and at approximately present prices, equals more than 200 billion tons, or 500 times current annual consumption. With continued improvement in the technology of coal transportation and even lower costs of production, there is every reason to anticipate that coal will be available to utilities at even lower costs in the years ahead, thus making it an even more attractive fuel. The conclusion is inescapable that what the civilian nuclear power program amounts to is the forced feeding of a new industry to use up the excess capacity developed by AEC over the years and to justify present appropriations and levels of operations.

(3) To date, the Government has spent about \$1.275 billion on the civilian power program. Its current budget is \$216 million annually to further and expand the program of subsidy. Over the assumed life of one large nuclear plant (Connecticut Yankee Atomic) the total Government subsidy will amount to \$45.6 million. Obviously, a nuclear plant with a subsidy of this magnitude will enjoy a tremendous advantage over privately built and privately financed coal-fired electric utility plants.

(4) There is a matter of safety involved in the construction of nuclear powerplants, particularly in or near centers of population, which has not been settled. The proposals to build nuclear plants in the Borough of Queens in New York; near Atlantic City, N.J.; and in the San Francisco and Los Angeles areas of California have created deep concern for the welfare of the residents of the areas. To quote an eminent scientist, "what is involved in atomic plants is the fact that accidents of one kind or another are an absolute certainty. They are inevitable. The difference here is that an accident associated with atomic power is of an altogether different magnitude than an accident associated with coal-fired generation plants."

The law requires private insurance of up to \$60 million must be carried on atomic energy powerplants, depending on the installed capacity. In addition each atomic plant must be indemnified in the amount of \$500 million against accidents. The \$60 million is the maximum amount that private insurance companies will write. Thus, since it is impossible (for the first time in the history of America) to obtain the enormous amount of insurance considered necessary for an atomic plant the Government supplies the \$500 million indemnity at a nominal insurance premium of only \$30 per year per thermal megawatt of installed capacity. For a plant of 140,000 electric kilowatts of capacity, this would come to about \$12,000 or \$13,000 per year. This insurance alone proves the colossal danger of an atomic energy plant, particularly one close to centers of habitation.

Thus, it seems to us, in carefully reviewing the nuclear power program, that the massive Government subsidies which have been, and are continuing to be spent, on the building of large nonexperimental commercial plants cannot be justified.

The umbilical cord between the Government and the civilian nuclear power industry must be severed and this new industry must be made to stand on its own feet in the rough competitive power battle. Under such conditions, if nuclear powerplants are needed and are feasible, they will be built, and without Government subsidy. But it is our belief, based upon a careful study of all relevant economic data, that without Government subsidy these plants would not be built nearly as rapidly and in as great numbers as they will be under the present AEC subsidy program.

We sincerely believe that it is unfair, and in contradiction of our free enterprise system, for the Government to spend the taxpayers' money—including taxes collected from coal and other fuels industries—to encourage through subsidy the construction of plants that threaten to undermine the future growth of—and perhaps eventually to destroy—coal and associated industries upon which so many people depend for a livelihood and which play such a vital role in our economy, and in addition endanger their lives and property.

Sincerely,

JOSEPH E. MOODY, *President.*

U.S. SENATE,
COMMITTEE ON PUBLIC WORKS,
November 18, 1963.

HON. CARL HAYDEN,
Chairman, Committee on Appropriations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: The Committee on Appropriations of the House of Representatives has reported the public works appropriations bill for fiscal year 1964. Under "Title III—Independent Offices," are the recommended appropriations for the Atomic Energy Commission.

It is my understanding that a special subcommittee of the Senate Committee on Appropriations will conduct a closed hearing under security conditions tomorrow morning on Atomic Energy Commission budget estimates.

I have only general comments to make on the classified AEC items; namely, to express the hope that the Appropriations Committee of this body can and will find appropriate ways, without endangering security, to recommend more substantial reductions in funds for nuclear weaponry and special materials than did the Appropriations Committee of the House. In fact, the committee of the other body did not recommend any reduction in the \$783 million AEC estimate for nuclear weapons, and recommended a cut of slightly under \$5.5 million from the AEC estimate of \$480,471,000 for special nuclear materials.

In addition to reductions in foreign aid for which I voted during action on the authorization bill, it has been my hope that there would develop in this session considerable savings in the areas of defense, space, and atomic energy so that vital domestic program needs would not have to bear the brunt of economy chopping to accommodate a tax cut.

We failed to shave the funding for defense below the level of the last fiscal year. It remains to be seen what the action will be with respect to the space and atomic energy programs. But it is my view that we must try harder in these areas so as not to place the bulk of the economy burden on the tools of foreign policy administration and on the programs to meet human and community needs in the United States.

We will soon be confronting our responsibilities and our opportunities in the matter of appropriating for the atomic energy program. I have made observations concerning the special nuclear materials and weapons items of the AEC budget. Those two, together with the reactor development items, account for almost \$1,794 million of the total AEC budget estimate of \$2,423,500,000 for fiscal 1964.

I am not an advocate of shortchanging research in any field, including that of atomic energy. I hope the House Appropriations Committee, in recommending a \$33.5 million reduction from estimates for nuclear reactor development, a cut of almost \$27 million for physical research, and another of approximately \$8.3 million for biology and medicine AEC programs, did not endanger research progress in vital areas.

But I commend for favorable consideration the language in the House committee's report in which it expresses "the opinion that continuation of the subsidy program (of development and design assistance to utilities) is no longer necessary to stimulate the construction of power reactors, since it has been demonstrated that they are now producing electric power at competitive costs, at least in those areas of high conventional fuel costs."

It continues to be disturbing to those of us from conventional fuel producing regions—especially coal economy areas—to be informed that something in the neighborhood of \$200 million remain in the House committee recommendations, and more than that in the AEC budget estimates now before the Senate committee, for grants to utilities under the reactor development program of the AEC.

Mr. Chairman, huge subsidies have been paid to utilities to aid in nuclear power development to make such power competitive with that generated by coal-burning and oil-burning plants. But I know of none having been paid or pledged to progressive investor-owned utilities making very large investments in new plants in the coalfields to generate extra high voltage electricity for transmission to the load centers where energy requirements are increasing.

The subsidies to utilities to aid them in nuclear power development are both shocking and inequitable when compared with the small amounts of coal research subsidized by the same Government which is aiding utilities to find ways to substitute nuclear energy for coal and other conventional fuels. Here, then, is Government assistance for an effort to destroy coal markets without a compen-

satory degree of aid and effort to help research and develop new uses and new markets for coal. There must be parity. This is simple justice. Nothing less will suffice. If an amount on the order of \$200 million annually is subscribed in research and development and design assistance to further the progress of nuclear power, why should coal research and development not be accorded a similar amount in Government subsidies? We must give profound consideration to the fact that the electric power market is coal's major existing outlet—indeed, its last frontier until some radical breakthrough in coal research creates a vast new horizon.

In light of these factors, it should be understandable that the current activity of the Atomic Energy Commission which, more than any other, is of the greatest concern to the conventional fuel industries—particularly coal—is that of subsidizing construction of large, nonexperimental commercial nuclear electric plants embodying the pressurized water or boiling-water reactors.

I am aware that section 110(c) of Public Law 87-701 (AEC Authorizations for Fiscal Year 1963) authorized the Commission to furnish funds for design assistance to utilities, notwithstanding the "no subsidy" provisions of section 169 of the Atomic Energy Act of 1954, as amended. This, in my judgment, was a mistake and it should have been corrected.

It is difficult to understand how the Government subsidization of these large commercial plants—conveniently termed "demonstration plants"—can be justified. Nevertheless, the AEC is in the process of working out contractual arrangements for the construction of three such plants in the 400,000- to 500,000-kilowatt range. The plants and the amounts of direct AEC subsidy involved are as follows:

	Fuel waiver subsidy	Design subsidy
Southern California Edison.....	\$6,500,000	\$6,522,960
Connecticut Yankee Atomic.....	7,145,000	6,050,000
Los Angeles Department of Water.....	8,200,000	8,000,000
Total.....	21,845,000	20,572,960
Grand total.....	42,417,960	

I hope it will be the consensus of the Appropriations Committee of this body that, as the House committee has stated in its report, "continuation of this subsidy program is no longer necessary to stimulate construction of power reactors, since it has been demonstrated that they are now producing electric power at competitive cost, at least in those areas of high conventional fuel costs."

In fact, I feel there is justification for suggesting that there be provided in the fiscal 1964 appropriations for the AEC a prohibition against the use of any such funds, under the civilian nuclear power program, for construction of additional water reactors or any type of reactor which has been proven.

There should be no arguing the fact that the water reactor concept is thoroughly "proven."

(A reactor concept is considered by AEC to be proven when it has developed to the stage where engineering feasibility has been established or where reactor experiment or prototype experience has demonstrated confidence in reactor reliability for the general size contemplated.)

Dr. Glenn T. Seaborg, the AEC Chairman, has stated that the pressurized water and boiling water reactors are examples of proven concepts.

In its report to the President of the United States on civilian nuclear power, November 20, 1962, the Atomic Energy Commission declared that water reactors "have definitely arrived." To this assertion the AEC report added: "They are reliable and safe. It is believed that large reactors of this type could now be built and operated in high cost fuel areas with a lifetime promise of greater economy than conventional plants."

This being the case, why should the Government continue to subsidize utilities for any water reactor installation or design assistance? And why should the Government subsidize their supply of generating materials? Let the nuclear-minded utilities finance their own capital expansions and fuel requirements, as do utilities using conventional fuels in their generating processes.

And for those who do not recognize the pace of nuclear power development, or who possibly wish to cover up the facts, attention is called to appraisals by utility

executives who declare that "nuclear kilowatts" are on the threshold of being competitive with "fossil kilowatts"—and mainly because of the impetus given to the development by the Government, much of it at the direct expense of long-established conventional fuels industries. Please note the following:

John V. Cleary, senior vice president of the Consolidated Edison Co., in defending his company's investment in a 275,000 kilowatt nuclear powerplant with a proven water reactor, declared: "The Indian Point station * * * is one of the company's production plants, essential to the production of electricity to meet our present load requirements. In fact, it is classified as a base-load plant." He added that his company plans to install an even larger nuclear powerplant with the same type of water reactor in the Borough of Queens, New York City, and one major consideration for the decision to build this plant (Ravenswood) is that, "from a cost standpoint, it will be competitive with our latest so-called conventional plant."

Louis H. Roddis, Jr., president of the Pennsylvania Electric Co., has stated that two of the large nuclear powerplants listed to be built on the east coast and west coast with Government subsidies of over \$12 million each for design assistance and fuel waiver, "will produce electricity at a lower unit cost than fossil fuel plants in the same location." He added that on a "nonsubsidized basis nuclear kilowatts will be competitive with fossil kilowatts in approximately one-half of the United States" by the time these nuclear powerplants go into operation in 1967-68.

Thus, Mr. Chairman, we have it on the authority of the Atomic Energy Commission and of spokesmen for the investor-owned electric utilities that we are not dealing with experimental plants in these large water reactors. They are of proven concept, and, according to authoritative and highly placed utility executives, they can compete with coal-fired plants in some sections of the Nation today on a nonsubsidized basis.

Westinghouse and General Electric, I am informed, are commercially producing and selling the water reactors to private utilities. I am told that one atomic expert has said that "these reactors have become so pedestrian that you can just about walk in and buy one off the shelf."

The question arises, then, as to why continued Government subsidy is necessary to encourage the construction of proven, commercial nuclear plants.

Although Consolidated Edison has announced it will not seek a design subsidy or waiver of fuel use charges for the first 5 years of its intended Ravenswood operations (Queens, New York City), as will be provided the Southern California Edison, Connecticut Yankee Atomic, and Los Angeles Department of Water plants at a cost of more than \$42 million in taxpayers' dollars, we know these Government-provided benefits will accrue to Consolidated Edison:

Use of Government-owned nuclear fuel at Government interest rates instead of the much higher private financing rates; also, \$500 million in indemnity insurance from the Government at significantly less cost than private insurance; and the sale to the Government at a fixed price of \$10 per gram of the plutonium manufactured in burning the Government-owned fuel.

Mr. Chairman, in the case of the three plants—two in California and Connecticut Yankee—scheduled for construction in the immediate future with subsidies which probably will exceed \$42 million, we recognize that contracts already are signed and that payments will be made from appropriations provided AEC in prior years.

But it seems to me that there is a clear-cut need for the Congress to insure that no Government funds are pledged to the subsidization of additional large, commercial nuclear powerplants which use the proven pressurized water or boiling water reactor. I hope that there will not be appropriations made for such purposes and, indeed, that there be prohibitions against using appropriated moneys for any new utilization in this area.

Perhaps the long-range solution to the problem lies in amending the Atomic Energy Act to make more explicit the procedure the AEC must follow in licensing plants of proven design as commercial installations, rather than as experimental or demonstration plants.

Respectfully submitted.

JENNINGS RANDOLPH.

Senator HILL. Is there anything further anyone would like to add? If there are no further questions, we stand in recess.

(Whereupon, at 11:55 a.m., Tuesday, November 19, 1963, the subcommittee recessed.)

PUBLIC WORKS APPROPRIATIONS FOR 1964

TUESDAY, NOVEMBER 19, 1963

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 2:05 p.m., pursuant to notice, in room S. 126, U.S. Capitol Building, Senator Lister Hill (chairman of the subcommittee) presiding.

Present: Senators Hill and Stennis.

Also present: Senator Cooper.

TENNESSEE VALLEY AUTHORITY

STATEMENT OF A. J. WAGNER, CHAIRMAN OF THE BOARD, TENNESSEE VALLEY AUTHORITY; ACCOMPANIED BY FRANK E. SMITH, DIRECTOR; L. J. VAN MOL, GENERAL MANAGER; G. O. WESSENAUER, MANAGER OF POWER; GEORGE P. PALO, MANAGER, OFFICE OF ENGINEERING DESIGN AND CONSTRUCTION; LEWIS B. NELSON, MANAGER OF AGRICULTURAL AND CHEMICAL DEVELOPMENT; CHARLES J. McCARTHY, GENERAL COUNSEL; MARGUERITE OWEN, WASHINGTON REPRESENTATIVE; E. PHILIP ERICSON, ASSISTANT TO THE GENERAL MANAGER (BUDGET AND PLANNING); AND L. E. ELLIS, CHIEF, BUDGET STAFF

STATEMENT OF THE CHAIRMAN

Senator HILL. The committee will kindly come to order.

Chairman Wagner, we are very happy to have you here. We are very happy to see you also, Mr. Smith. It is a pleasure to have you here. Before proceeding, there will be placed in the record at this point a summary of your appropriation request and in addition, selected tables setting forth a summary of your operations involving appropriated and nonappropriated funds. Now, you gentlemen may proceed in your own way.

(The material referred to follows:)

Summary of budget financed from appropriations

[For fiscal years ending June 30, 1962, 1963, and 1964]

	1962 actual	1963 estimate	1964 estimate
ACQUISITION OF ASSETS			
Navigation, flood control, and power program:			
Multipurpose dams:			
Melton Hill Dam and Reservoir.....	\$7,326,377	\$2,677,000	\$2,054,000
Nickajack Dam and Reservoir.....		1,600,000	4,300,000
Navigation facilities:			
New lock at Guntersville Dam.....	57,602	2,590,000	8,500,000
New lock at Wheeler Dam.....	7,895,796	4,471,000	232,000
New lock at Wilson Dam.....	227,783	330,000	
Rehabilitation of original lock at Wheeler Dam.....	5,648,554	338,000	
Additions and improvements at existing navigation facilities.....	162,723	809,000	171,000
Flood control facilities.....	8,986	32,000	1,000,000
Additions and improvements at existing multiple-use facilities.....	646,489	705,000	282,000
Investigations for future facilities.....	69,674	219,000	249,000
Distribution of administrative and general expenses.....	273,196	410,000	522,000
Total navigation, flood control, and power program.....	22,317,180	13,181,000	17,310,000
Fertilizer, agricultural, and munitions program:			
Chemical facilities.....	2,563,833	8,844,000	6,835,000
Distribution of administrative and general expenses.....	38,501	50,000	60,000
Total fertilizer, agricultural, and munitions program.....	2,602,334	8,894,000	6,895,000
Cooperative valley development program:			
Beech River multipurpose water control system.....		2,450,000	2,537,000
Investigations for future facilities.....	95,606	82,000	551,000
Distribution of administrative and general expenses.....	2,924	55,000	75,000
Total cooperative valley development program.....	98,530	2,587,000	3,163,000
General service activities:			
General facilities.....	732,420	1,138,465	3,142,000
Distribution of administrative and general expenses.....	8,026	15,000	25,000
Total general service activities.....	740,446	1,153,465	3,167,000
Total acquisition of assets.....	25,758,490	25,815,465	30,535,000
EXPENSES			
Navigation, flood control, and power program:			
Navigation operations.....	2,516,638	462,000	489,000
Flood control operations.....	410,080	451,000	449,000
Multipurpose reservoir operations.....	2,845,444	3,191,000	3,282,000
Topographic mapping.....	136,530	90,000	90,000
Distribution of administrative and general expenses.....	226,920	231,000	245,000
Total navigation, flood control, and power program.....	6,135,612	4,425,000	4,555,000
Fertilizer, agricultural, and munitions program:			
Fertilizer, agricultural, and munitions development.....	3,529,005	3,992,000	6,069,000
Distribution of administrative and general expenses.....	125,421	145,000	230,000
Total fertilizer, agricultural, and munitions program.....	3,654,426	4,137,000	6,299,000
Cooperative valley development program:			
Cooperative valley development.....	1,469,116	2,135,000	2,720,000
Distribution of administrative and general expenses.....	81,671	105,000	145,000
Total cooperative valley development program.....	1,550,787	2,240,000	2,865,000
General service activities: Maintenance of bridges financed by others on TVA dams.....			
	5,674	9,000	30,000
Total general service activities.....	5,674	9,000	30,000
Total expenses.....	11,346,499	10,811,000	13,740,000

¹ Represents the unobligated balance of funds budgeted for Hales Bar leakage abatement. This balance will be held in reserve for application to the Nickajack project.

Summary of budget financed from appropriations—Continued

	1962 actual	1963 estimate	1964 estimate
INVENTORIES AND PROPERTY TRANSFERS			
General service activities:			
General inventories.....	\$39,275		
Property transfers.....	-70,253		
Total inventories and property transfers.....	-30,978		
Total budget financed from appropriations.....	37,074,011	\$36,626,465	\$44,284,000
FINANCING			
Appropriation.....	38,203,000	35,071,000	44,284,000
Balance brought forward.....	426,476	1,555,465	
Balance carried forward.....	-1,555,465		
Total financing.....	37,074,011	36,626,465	44,284,000

Summary of budget financed from power proceeds and borrowings

[For fiscal years ending June 30, 1962, 1963 and 1964]

	1962 actual	1963 estimate	1964 estimate
ACQUISITION OF ASSETS			
Navigation, flood control, and power program:			
Multipurpose dam: Melton Hill Dam and Reservoir.....	\$7,447,767	\$9,225,000	-\$64,000
Power supply facilities:			
Widows Creek steamplant unit 8.....	20,765,603	16,453,000	14,062,000
Colbert steamplant unit 5.....	21,364,744	3,406,000	1,395,000
Paradise steamplant units 1 and 2.....	71,718,863	28,796,000	11,601,000
Bull Run steamplant unit 1.....	6,192,668	31,824,000	53,249,000
Additional steam unit.....		70,000	1,567,000
Wheeler hydro units 19 to 21.....	2,408,300	7,000	
Wheeler hydro units 9 to 11.....	7,697,015	2,561,000	486,000
Transmission system facilities.....	33,774,375	37,000,000	50,000,000
Coal land and rights.....	640,626	1,250,000	1,000,000
Additions and improvements at existing power facilities.....	742,064	1,506,000	1,247,000
Investigations for future facilities.....	113,855	204,000	322,000
Distribution of administrative and general expenses.....	2,088,211	2,049,000	2,050,000
Total acquisition of assets.....	174,954,091	134,351,000	136,915,000
EXPENSES			
Navigation, flood control, and power program:			
Power operations.....	142,047,492	155,497,000	166,411,000
Allocation of multipurpose reservoir operations.....	1,905,674	2,138,000	2,201,000
Distribution of administrative and general expenses.....	2,535,142	2,716,000	2,920,000
Total expenses.....	146,488,308	160,351,000	171,532,000
INVENTORIES AND DEFERRED CHARGES			
Navigation, flood control, and power program:			
Power inventories.....	3,946,748	-2,723,000	-631,000
Deferred charges.....	3,755	-43,000	-21,000
Total inventories and deferred charges.....	3,950,503	-2,766,000	-652,000
Total budget financed from power proceeds and borrowings.....	325,392,902	291,936,000	307,795,000
FINANCING			
Balance brought forward.....	5,538,606	-15,784,528	-20,737,528
Proceeds from borrowings.....	94,382,500	65,000,000	64,700,000
Current proceeds:			
Power operations.....	254,779,433	269,282,000	289,877,000
Sale of retired plant.....	429,406	473,000	205,000
Miscellaneous receipts.....	1,020,069	1,103,000	428,000
Total current proceeds.....	256,228,908	270,858,000	290,511,000
Payments to Treasury:			
Reduction of appropriate investment.....	-10,000,000	-10,000,000	-10,000,000
Dividend (return on appropriation investment).....	-35,541,640	-38,875,000	-38,200,000
Total payments to Treasury.....	-45,541,640	-48,875,000	-48,200,000
Balance carried forward.....	15,784,528	20,737,528	21,521,528
Total financing.....	325,392,902	291,936,000	307,795,000

PUBLIC WORKS APPROPRIATIONS, 1964

Summary budget financed from nonpower proceeds

[For fiscal years ending June 30, 1962, 1963, and 1964]

	1962 actual	1963 estimate	1964 estimate
EXPENSES			
Navigation, flood control, and power program: Multipurpose reservoir operations.....	\$292,396	\$333,000	\$351,000
Fertilizer, agricultural, and munitions program:			
Fertilizer, agricultural, and munitions development.....	19,014,778	19,973,000	17,857,000
Distribution of administrative and general expenses.....	446,848	475,000	440,000
Total fertilizer, agricultural, and munitions program.....	19,461,626	20,448,000	18,297,000
Cooperative valley development program: Cooperative valley development.....	60,628	357,000	486,000
General service activities:			
Reimbursable services.....	5,058,161	10,697,000	8,287,000
Distribution of administrative and general expenses.....	77,442	200,000	150,000
Total general service activities.....	5,135,603	10,897,000	8,437,000
Total expenses.....	24,950,253	32,035,000	27,571,000
INVENTORIES			
Fertilizer, agricultural, and munitions program: Chemical inventories.....	-1,234,860	-500,000	
Total budget financed from nonpower proceeds.....	23,715,393	31,535,000	27,571,000
FINANCING			
Balance brought forward, including continuing fund.....	2,760,211	2,294,142	1,011,142
Current proceeds:			
Navigation operations.....	1,648	4,000	5,000
Multipurpose reservoir operations.....	292,396	333,000	351,000
Fertilizer, agricultural, and munitions development.....	17,048,313	18,176,000	17,714,000
Cooperative valley development.....	68,553	358,000	487,000
Reimbursable services.....	5,135,603	10,897,000	8,437,000
Sale of retired plant and miscellaneous receipts.....	702,811	484,000	576,000
Total current proceeds.....	23,249,324	30,252,000	27,570,000
Balance carried forward, including continuing fund.....	-2,294,142	-1,011,142	-1,010,142
Total financing.....	23,715,393	31,535,000	27,571,000

PUBLIC WORKS APPROPRIATIONS, 1964

Selected data for major projects

Fiscal year construction started	Nameplate generating capacity and service dates		Actual, to June 30, 1962 (net)	Budget			Administrative general expenses, total project	Estimated incidental income, fiscal year 1963-64	Estimated total cost
	Capacity, kilowatts	Service dates		Fiscal year 1963	Estimated				
					Fiscal year 1964	To complete			
Financed from appropriated funds:									
Multipurpose dam:									
Melton Hill	122,000	July 1963	\$12,563,180	\$2,677,000	\$2,054,000	\$310,000	\$4,000	\$17,600,000	
Nicksajack		January 1967 (2 units); April, May 1967 ¹		2,600,000	4,300,000	1,100,000		170,000,000	
Navigation locks:									
New lock at Gunterville Dam		June 1965	77,317	2,500,000	8,500,000	325,000		16,500,000	
New lock at Wheeler Dam		April 1963	11,507,189	4,471,000	232,000	324,867	35,000	16,500,000	
New lock at Wilson Dam		November 1969	37,244,710	330,000		650,869		38,225,679	
Rehabilitation of original lock at Wheeler Dam		April 1962	6,375,387	338,000		85,809		6,794,196	
Beech River multipurpose water control system		June 1965		2,450,000	2,537,000	125,000		6,000,000	
Financed from power proceeds and borrowings:									
Multipurpose dams: Melton Hill units 1 to 2	72,000	July, September 1963	10,494,687	9,225,000	-84,000	355,000	10,000	20,000,000	
Power supply facilities:									
Widows Creek steamplant unit 8	500,000	October 1964	29,072,160	16,453,000	14,062,000	610,000	28,000	62,500,000	
Colbert steamplant unit 5	500,000	March 1963	57,982,049	3,406,000	1,395,000	638,315	45,000	63,376,364	
Paradise steamplant unit 1	1,300,000	May, October 1963	138,740,887	28,796,000	11,661,000	1,775,000	78,000	183,000,000	
Bull Run steamplant unit 1	900,000	November 1965	6,492,376	31,824,000	53,249,000	1,450,000	100,000	133,000,000	
Additional steam unit	1,100,000	(²)		7,000		1,400,000		150,000,000	
Wilson hydro units 19 to 21	162,000	December 1961; January, April 1962	20,992,770	70,000	1,567,000	246,222		21,245,922	
Wheeler hydro units 9 to 11	97,200	December 1962; March, June 1963	16,437,334	2,551,000	486,000	246,124		19,730,468	

¹ Preliminary.

² Represents the unobligated balance or funds budgeted for Hales Bar leakage abatement. This balance will be held in reserve for application to the Nicksajack project.

³ Not yet determined.

REQUEST BEFORE COMMITTEE

Mr. WAGNER. Thank you, Mr. Chairman.

The request before your committee today is for a total of \$48,284,000. This amount provides for continuing TVA's resource development programs, with which you are familiar from long years of acquaintance with them. There is the program of navigation development. Traffic on the river is setting new records each year. Use of the navigation channel has shown a 100-percent growth in the last 10 years. The appropriation request includes continuation of TVA's work in flood control. That is progressing well, too. In March of this year, for instance, we regulated a major flood and saved Chattanooga alone \$100 million, and prevented another \$14 million damages elsewhere in the Tennessee Valley and on the lower Ohio and Mississippi Rivers.

The appropriation request also provides for continuing programs in forestry and agriculture, and for tributary area development.

In addition, it provides for operating the multipurpose dam and reservoir system, a system which, as you know, benefits not only the Tennessee Valley, but neighboring regions too. For example, in the dry weather this fall—and it has been very dry in much of the country, as you know—about one-third of the flow of the Mississippi River below the mouth of the Ohio was provided by releases from TVA's multipurpose reservoirs in the Tennessee Valley. These releases added about 2 feet to the navigable depth in the lower Mississippi, at a very crucial time.

Senator HILL. They would have been in pretty serious trouble; would they not?

Mr. WAGNER. Yes, sir; 2 feet is extremely vital in a dry period such as this.

GUNTERSVILLE LOCK

The appropriation request provides for continuing construction already underway, projects with which you are familiar—continuing construction of the Guntersville lock in northern Alabama—some funds—

Senator HILL. When will you finish that?

Mr. WAGNER. That will be completed in 1965 under the present schedule.

Senator HILL. Unless, some untoward event should happen.

MELTON HILL PROJECT

Mr. WAGNER. That is correct. Our request also provides for essentially completing work at the Melton Hill project, and for continuing the rehabilitation of the chemical facilities at Muscle Shoals—work on a new phosphorus furnace and air-cleaning equipment related to it, a nitric acid plant, and for work on a number of other facilities there.

NICKAJACK DAM AND RESERVOIR

In addition to these continuing activities, funds are requested for new projects. The first of these is the Nickajack Dam and Reservoir. The request is for \$4.3 million for fiscal year 1964, and the total estimated cost is about \$70 million. This will be a multiple-purpose project providing for navigation, flood control, and power production

on the Tennessee River. It is unusual in that it will be built to replace the existing Hales Bar Dam and Reservoir below Chattanooga.

Senator HILL. That dam and reservoir is pretty old; is it not?

Mr. WAGNER. Yes, sir, it is. It was built in the period from 1905 to 1916 and was acquired by TVA from the Tennessee Electric Power Co. in 1939, along with other generating and transmission properties.

Now, this dam, as you recognize, was built a long time ago, at a time when knowledge about foundations was much less complete than it is now. Construction methods were rather primitive in those days. I have here a photograph that will give you an idea of the nature of this construction. You see timber stiff leg derricks, wooden cribs, and so on.

Senator HILL. A little different from what you have today; isn't it?

Mr. WAGNER. Yes, sir. And I think it is not surprising that with construction methods at that stage of development, all of the solution channels and potential leaks in the foundation were not discovered. Shortly after the reservoir was filled, the owners of the project found that the dam was leaking badly, and they undertook extensive work to correct the leaks with partial success.

When TVA acquired the dam, the leakage was again considerable. From 1940 to 1943 we undertook a program to correct the leaks. It was temporarily successful. But additional channels have since opened in the limestone. We started another leakage abatement program in 1960, and at this time started foundation exploration for a new, large lock that was going to be needed at the project. This revealed even a poorer foundation condition than we had been aware of up to that time, as we got downstream from the main axis of the dam.

We examined the whole situation very carefully and brought in some consultants to check our own judgment. We determined that it would be so costly to repair this foundation to a point where we could be certain it was safe and would last a reasonable length of time and that it would be better to build a completely new dam and reservoir about 6 miles downstream, where there was a sound foundation.

This is the background of the Nickajack project.

FLOOD CONTROL PROJECT FOR BRISTOL, TENN.-VA.

Another new project in the appropriation request is a local flood control project for Bristol, Tenn.-Va., in the upper reaches of the watershed. Included in our requested appropriation is \$1 million for starting this work in fiscal year 1964. The estimated total cost is \$2.9 million. We would hope to complete it in 1965.

The towns of Bristol, Tenn., and Va., are upstream from the area controlled by our present dam and reservoir system. The cities have damaging floods every 4 or 5 years, and in some years have flooded as many as five times. There is a potential damage of \$2.9 million from a single flood, and the average annual damages are about \$232,000.

We have been working with the governments of these two towns, and with their engineers and planning groups for several years, trying

to develop the best solution to this problem, and we are now ready to move on it.

NEW FEATURES IN PROJECT

There are several new features in this project. For example, we have determined exactly what areas within the cities are subject to flooding; the city of Bristol, Va., has enacted a zoning ordinance to prevent further construction in its flood danger areas, and Bristol, Tenn., has such zoning ordinances under consideration.

This is a part of the program we have encouraged for some time, to direct the new development in cities away from flood danger areas.

WEEKLY NEWSLETTER

Senator HILL. In connection with your discussion of the Bristol project I am placing in the record a portion of the weekly newsletter published by TVA, referring to the progress being made in planning for this proposed item.

(The information referred to follows:)

WEEKLY NEWS LETTER OF TENNESSEE VALLEY AUTHORITY, KNOXVILLE, TENN.

TVA said today that final arrangements have been completed with Bristol, Tenn., and Bristol, Va., for a local flood damage prevention plan which is the first of its kind in the Nation's long history of work with local flood problems.

Under the cooperative plan more than 2 miles of creek channels will be enlarged; nearly 400 commercial and industrial buildings may be made watertight; and two small dams and reservoirs will be built on creeks several miles above the cities. Total cost is estimated at \$3½ million.

The dams are to be detention type with outlets of a size that will release floodwaters gradually. One will have a dry reservoir except when holding back floodwaters. The other will have a 35-acre permanent pool for recreation.

In addition, each of the cities will revise its zoning ordinance, subdivision regulations, and building code to provide controls over areas which will still be subject to some flooding.

Since 1953 TVA has worked with more than a hundred Tennessee Valley communities, through State planning agencies, to help meet flood problems that are beyond the reach of its regional flood control on the Tennessee River and its larger tributaries. Three dozen of the cities and communities have formally adopted regulations controlling development in areas subject to flooding. More than 70 have taken less formal action.

TVA's role has been to prepare engineering reports and give technical help needed as a basis for local action. The program has attracted national attention as a proving ground for techniques to deal with similar flood problems faced by hundreds of American cities and towns.

The Bristol project includes a new policy of encouraging flood proofing of buildings and recognizing that cost as part of the local contributions. This also is the first project in which local officials and citizens were required to take a greater degree of leadership in formulation of the plan to assure that all available suggestions and experience would be included.

One of the dams and reservoirs is to be on Beaver Creek and the other will be a few miles north of that site, on the tributary Clear Creek. The permanent pool or lake of about 35 acres is to be in the Clear Creek detention reservoir area.

Bristol, Va., plans the development of full recreational facilities around the 35-acre lake as well as limited facilities throughout the remainder of the 200 acres in the Clear Creek Reservoir area and 175 acres in the Beaver Creek Reservoir area. Various types of recreation will be available in the two areas. Washington County may work with the city of Bristol in developing these areas.

The two Bristols organized a joint flood study committee to determine the most desirable plan among several possibilities, TVA said, and more than a score of local citizens worked for over 2 years in preparing it.

Similar projects are under consideration at Sevierville and Athens, Tenn., TVA said.

Mr. WAGNER. Now, in addition to zoning by the cities, some of the buildings already there are to be flood proofed, by sealing off basement windows, waterproofing walls, and protecting electrical equipment and that sort of thing. These steps will be taken by the private owners at a cost of better than \$200,000, with some technical assistance from consultants to be employed by the cities and advice from TVA with respect to potential flood heights. In addition the cities will take on the job of enlarging the channels of the streams through the cities, and adjusting bridge heights at a further cost to them of about \$200,000.

TVA'S PART

TVA's part is to build two detention dams upstream which will reduce the volume of water that could descend on the cities. One of these reservoirs will have a small permanent pool which will serve as a basis for recreation development by the city of Bristol, Va., and the city will pay about \$120,000 toward the cost of the project, representing the extra expenditure that is needed for this purpose.

The lands behind detention dams, you understand, are covered with water only in the periods when there are floods being controlled. The rest of the time the land is there with the trees on it, and it is open and available for use. Generally such land has not been used. It has just been held for flood storage.

We are trying to develop, with the two cities, plans whereby they would manage these lands for recreation. They can lay out hiking and horseback riding trails, and picnic areas—the latter probably just above the flood level—and the reservoir lands would have year-round usefulness. The effort is to find out whether these lands can serve some purpose in addition to flood control.

Senator HILL. This is something new, isn't it?

Mr. WAGNER. Yes, sir, this is a new idea. We hope if it develops here it can be used in detention reservoirs which may be built in other parts of the country.

The third major new project—

COOPERATIVE ENTERPRISE

Senator HILL. This is a cooperative enterprise with TVA and the two cities, is that right?

Mr. WAGNER. That's correct, sir—cooperative both in the way the project will be used, and in the provision of funds to build it and operate it.

Senator HILL. Protect the cities from the floodwaters, and then to make use of the lands that might be flooded—make use of that land when it is not under water, is that correct?

Mr. WAGNER. That is correct, yes, sir.

Senator HILL. Which is a new idea.

Mr. WAGNER. Yes, sir; as far as we know this is a new idea.

LAND BETWEEN THE LAKES

The third major new project is the proposed development of a recreation area which we call Land Between the Lakes. The appropriation request—

Senator HILL. Excuse me a minute. Senator Cooper, if you have any questions to ask as we go along, don't hesitate. We are coming to Kentucky right now. I can hear the whistle blow. I saw you lean forward.

That's off the record.

Senator COOPER. I would like it to be on the record.

Senator HILL. All right, we will put it on the record.

Go ahead, Mr. Wagner.

Mr. WAGNER. The requested appropriation includes \$4 million for this project in fiscal year 1964. This project involves a land area of something over 170,000 acres between Barkley and Kentucky Reservoirs.

As you know, the Kentucky Reservoir is already built and filled—built by TVA. The Barkley Reservoir is under construction by the Corps of Engineers. It is due to be partially filled in the fall of 1964 and completely filled a year later.

Senator HILL. The Barkley is on the Cumberland, and the Kentucky is on the Tennessee.

Mr. WAGNER. That is correct.

I have some small maps here which outline this area. You may be interested in looking at them.

OPPORTUNITY FOR DEVELOPMENT OF TRACT OF RECREATIONAL LAND

You will see that the Tennessee and Cumberland Rivers, in their lower reaches, flow parallel to each other, about 6 or 8 miles apart, for a distance of nearly 40 miles. This creates a unique opportunity for the development of a recreational area with special emphasis on water-based recreation.

This area is heavily wooded. It is thinly populated—so far as we have been able to determine on the basis of preliminary estimates, there are only 2,600 to 3,000 people in this entire area of 170,000 acres.

The land is far from the best land in the Tennessee Valley area. It is relatively unproductive, except, of course, in some of the small creek bottoms. There are no virgin forests, no natural wonders here to preserve as is done in our national parks. But this will be a fine area for families to use for camping, to study nature, and to enjoy a wide variety of outdoor recreation activities.

CITIES WITHIN 500-MILE RADIUS

At one side of the small map which you have you will see some concentric circles showing that within 500 miles of this area, a days' drive on modern expressways, there are such cities as New Orleans, Birmingham, Kansas City, Chicago, Detroit, Cleveland, St. Louis, Cincinnati, Louisville, and Atlanta. I mention this because we believe that as our economy becomes more and more an industrial and urban economy, the need increases for opportunities for factory workers and their families, office workers and their families, to get into the outdoors for recreation, and unless we are careful, as the need increases, the opportunities will become fewer.

TVA intends to develop this area primarily for inexpensive camping by families and groups such as Boy Scouts and Girl Scouts, boys clubs, and other groups who find occasion to seek outdoor recreation.

The area offers unusual opportunities for water sports, for fishing, for camping, and for nature study, and TVA will also promote the propagation of waterfowl and wildlife.

WILDLIFE REFUGE

A part of it, nearly 60,000 acres, is already established as a wildlife refuge under the direction of the Fish and Wildlife Service. Some of the area now used for waterfowl feeding grounds will be inundated by the Barkeley Reservoir, but is being replaced further upstream on the reservoir. But we would propose to operate the entire Land Between the Lakes Area to promote the propagation of fish and wildlife—both waterfowl and upland game. And we hope here to learn whether it is possible to let the people who get into the out of doors get a little bit closer to waterfowl and to game, and to observe them. Game and fowl will be propagated for the benefit of the general public as well as for those who would hunt.

OPERATION OF FOREST LANDS

We also propose to operate the forest lands on a sustained yield management basis, and we plan to use this forest as an outdoor conservation classroom. If people are camping in the area during tree planting time, we hope they would not only want to watch tree planting, but to participate. We would arrange for them to plant trees, because we believe once a man has planted trees he will understand conservation better in the future.

In summary, we would develop Land Between the Lakes as a trial and a demonstration to find the most useful kind of a recreational development to fit the needs of our people during an industrial age. It would have, as the map indicates, significance to people all over the Central United States—some 70 million people live within 500 miles of this development.

We would, in short, hope to develop multiple uses of the area.

Senator HILL. Would you explain that "multiple" a little?

Mr. WAGNER. For forestry, for fish and wildlife purposes, for camping, for waterfowl—and in most wildlife areas I believe there comes a time when some thinning out of the wildlife is necessary. We would hope that at such times managed hunts at appropriate seasons of the year could be arranged.

WILDLIFE PROPAGATION

The wildlife area, the refuge already in this area, is nearly 60,000 acres. We would operate virtually the whole 170,000 acres of the Between the Lakes Area for wildlife propagation. There are numerous points where we can provide feeding grounds for waterfowl and this will be done.

Those, Mr. Chairman, are the principal features of the budget before you.

BREAKDOWN ON BUDGET ESTIMATE

Senator HILL. You spoke of the budget estimate being altogether \$48,284,000.

TENNESSEE VALLEY AUTHORITY

Budget appendix page	Heading	Original estimate	Revised estimate	Increase
891	Payments to Tennessee Valley Authority fund....	\$44,284,000	\$48,284,000	\$4,000,000

This amendment is to provide funds for the initiation of work, including land acquisition, for the Land Between the Lakes, a national recreation area in western Kentucky and Tennessee. Funds are needed to begin work prior to the commencement in December 1963 of impoundment of water behind Barkley Dam.

HOUSE REDUCTION

Senator HILL. Now, I note that the House reduced your budget estimate by \$2,284,000, with this statement.

Since there will only be about 6 months in which this high level of funding can be applied, the committee is confident that the sum of \$2,284,000 can be deleted without detriment to the progress of the programs.

What would be your judgment as to what that reduction would mean, and what would be the effect on the operations and programs of the TVA?

Mr. WAGNER. Mr. Chairman, in a large construction program such as TVA's, it is usually possible to make some adjustments in the timing of expenditures. I think it should be clear that if the funds are not provided in the current fiscal year, we would need them to be added later.

Generally, postponement of construction—stretching out the construction period—makes any project more expensive. I do not have an estimate of just what this would add to our costs in the present case. But this is a general statement that applies to construction programs.

Now, as a matter of fact the new projects that are included in this budget were scheduled for major work to begin in the second half of the fiscal year. The delay in starting them would not therefore substantially affect our fund requirements for the fiscal year. For instance, we would not have started major work on the Nickajack project until the spring anyway.

If the funds are reduced as proposed, it will require some rescheduling, which generally is not in the best interest of economical construction and it will, of course, increase fund requirements in subsequent years.

Senator HILL. Generally it does not make for economy; does it?

Mr. WAGNER. No, sir; that is correct.

INCREASE IN CONSTRUCTION COSTS

Senator HILL. We had testimony this morning from the Atomic Energy Commission—the way the price of construction has gone up since 1955 or 1956—it was rather astounding. Of course, you are faced with the same situation. The more you delay, the more your costs go up; is that correct?

Mr. WAGNER. That's correct.

Mr. SMITH. We will probably have a wage rate increase that will go into effect the first of the year, which is one factor, as an example.

Senator HILL. Well, I wanted to ask some questions about some other matters. Senator Stennis, is there anything you would like to ask about these items?

Senator STENNIS. I believe not, thank you.

Senator HILL. Senator Cooper, any questions you would like to ask?

GOVERNMENT OWNERSHIP OF LAND

Senator COOPER. I would like to say this to the other member of our congressional delegation. I have been very much interested in this project, called the Land Between the Lakes, which Mr. Wagner has described. As I understand, the total area involved would be about 170,000 acres.

Mr. WAGNER. That's correct.

Senator COOPER. How much of it is now under Government ownership?

Mr. WAGNER. In the neighborhood of 65,000 acres, I believe—65,000 to 70,000.

(NOTE.—The area now under Federal ownership is 65,800 acres and the total now under public ownership is 66,860 acres.)

Senator COOPER. And the purpose is over a period of years for TVA to acquire ownership of the remainder of the land?

Mr. WAGNER. Yes, sir; that is correct. The precise boundaries have not been determined. But in general it is to buy the Land Between the Lakes.

Senator COOPER. About 50,000 acres of this tract is now used as a wildlife refuge.

Mr. WAGNER. I believe it is a little more than that, sir. I do not have those figures exactly in mind, but it is around 60,000 or 65,000 acres.

(NOTE.—The area now being used as a wildlife refuge is 58,000 acres.)

PRIVATE DEVELOPMENT OF PART OF AREA

Senator COOPER. In general the entire area is not a highly developed area, it is one which has been used lightly at least for recreational purposes.

Mr. WAGNER. That is correct. It is not highly developed, and by comparison with the rest of the valley it is quite thinly populated.

Senator COOPER. I might ask you this, because the question will be raised, and has been raised with me, and with other members of our delegation.

There are groups in that area which contend that a certain part of that area should be set aside for private development. In fact, I had a call a few days ago from a lawyer who represents a group of people in there, and, in fact, he is here today to testify—that group desiring to hold part of it for private development. Is that a matter which which would be discussed between the TVA and such groups?

Mr. WAGNER. Yes, sir. The details of how the purchasing would be handled and so on we have not worked out entirely. But we would be glad when we have a green light on this—we will be glad to discuss this with the group.

As a matter of fact there are extensive private developments on the west shore of the Kentucky Reservoir and there will be on the east

shore of the Barkley Reservoir. We regard Land Between the Lakes as primarily a public area. The details are not worked out. We will be glad to talk with groups who have questions of this kind.

SUPPORT FOR PROPOSAL

Senator COOPER. I know this fact, but I think it should be made part of the record. Am I correct in saying that the State agencies involved, as well as the State administration, both Kentucky and Tennessee, have supported this proposal?

Mr. WAGNER. Yes, sir; it has been supported by those agencies.

Senator COOPER. Thank you, Mr. Chairman.

TYPE OF AREA

Senator STENNIS. I would like to ask one or two more questions about this area. What is the occupation of the people in it? Is this a farming area, or timber, or what?

Mr. WAGNER. It is almost entirely wooded. There are some small farms, little patches of land cleared in the valleys. I could not say, Senator, that there are not a few good farms. I don't know. But generally this is not a highly developed area.

Senator STENNIS. More or less natural state, with exceptions?

Mr. WAGNER. That's right. It is not an intensively developed, highly productive area.

Mr. SMITH. Historically it never has been; 104 years ago when General Grant was coming down to Fort Henry, he expected to get farm labor from the area to help him, but there was no farm labor available, because there were no farms developed in the area.

Senator HILL. Speaking about General Grant, did Andrew Jackson get through there?

Mr. SMITH. He came farther south.

Senator STENNIS. Well, I did not get to hear the first part of your testimony here, but we are standing right with TVA down in Mississippi. It serves an area of our State. We will get you to put a big dam in there yet.

THREE NEW PROJECTS

Senator HILL. Mr. Wagner, as you brought out in your statement, you have only what you might term three new projects here, is that correct?

Mr. WAGNER. Yes, sir.

Senator HILL. The Nickajack, which would take the place of this old dam that is no longer really serviceable. And then your flood control for Bristol, Tenn., and Bristol, Va. And then your facilities at your chemical and fertilizer plants.

Mr. WAGNER. And the Land Between the Lakes.

Senator HILL. Certainly, the Land Between the Lakes.

Mr. WAGNER. The chemical and fertilizer plant construction is a continuation of a rehabilitation program now underway.

Senator HILL. I did not have that Land Between the Lakes on this memo. But you did not furnish this memorandum.

BUDGET ESTIMATE COMPARED WITH 1963 APPROPRIATION

Now I note that your budget estimate for this year is some \$10,929,000 over your appropriation for the past fiscal year, is that correct?

Mr. WAGNER. Yes, the \$46 million included for TVA in the House bill is \$10,929,000 over our appropriation for 1963.

Senator HILL. Does that \$10 million largely go to these three projects?

Mr. WAGNER. Yes. It is largely for construction projects.

Senator HILL. And, of course, there is no power construction in this?

Mr. WAGNER. Not in this.

Senator HILL. Any other questions on this?

Senator COOPER. I would like to say this. I am not a member of this committee—but Congressman Frank Stubblefield, of the First Congressional District of Kentucky, in whose district this Between-the-Lakes area lies, cannot be here now because of work in the House. But I believe his administrative assistant is here. I know he has been very much interested in this project.

"NATURE'S CONSTANT GIFT"

Senator HILL. Well, we are glad to have that statement. Mr. Wagner, I have here a very interesting document "Nature's Constant Gift," a report on the water resource of the Tennessee Valley. I wish you would give us a picture, sir, of just what has happened under the TVA so far as your use of your land is concerned, the use of water, and how much higher the return has been to the people as a result of this better use of the land and the water resources.

Mr. WAGNER. Senator Hill, I will be glad to do that.

As this report points out, a substantial part of the water resource of the Tennessee Valley is used on the land—it never gets to the rivers. Thirty inches of the 52 inches of rain that falls in an average year is used either by the trees and the grass and the crops or is evaporated. So if the people of the region are to get any good from this 30 inches of rain, they have to utilize it as it falls on the land, it must be used there—it never gets to the rivers.

Now, improved use of water on the land involves activity primarily in the fields of forestry and agriculture.

Nearly 60 percent of the Tennessee Valley is in forest. The forests are a primary, basic resource of the region.

In the early days of TVA—

Senator HILL. Excuse me, Mr. Wagner. I see Congressman Stubblefield has just come in. Congressman, you can sit up here with us, if you wish. We would be glad to have you.

Mr. STUBBLEFIELD. Thank you, sir. I have a constituent back here that I would like to sit with.

Senator HILL. Very well.

SEVERE EROSION PROGRAM

Mr. WAGNER. The emphasis in the early days was primarily on planting trees as a means of controlling erosion. There was a very severe erosion problem in much of the Tennessee Valley.

Senator HILL. If I may interrupt you there, my friend Jonathan Daniels, of Raleigh, N.C., wrote, "The rivers ran red to the sea with the rich topsoil of the land." Is that correct?

Mr. WAGNER. Yes, sir; that is about correct.

REFORESTATION

In those early days nurseries established by TVA turned out hundreds of millions of high quality tree seedlings, and the land-owners in the valley planted them on their land. In all, about 800,000 acres have been reforested in the Tennessee Valley. This represents a lot of trees. But we still have a little better than a million acres of open lands to reforest.

I think you might be interested to know or recall that in the middle thirties the Civilian Conservation Corps, the CCC, planted pine trees. In the Tennessee Valley they planted about 70,000 acres. The trees on those 70,000 acres are now producing about a million dollars a year income for the owners of the land on which they are planted.

Senator HILL. That much income a year?

Mr. WAGNER. A million dollars a year. I am sure this was not visualized in those days. We thought of the CCC primarily as a program to keep young men employed, and to stop erosion of the soil. But the results show the economic benefits that can come from tending to our forests.

Senator STENNIS. 70,000 acres?

Mr. WAGNER. About 70,000 acres; yes, sir.

"PLANT TREES—GROW JOBS" PROGRAM

We currently are working with the seven valley States in a program which we call "Plant Trees—Grow Jobs." The goal of this program is to cut in half the time that was estimated to be required to reforest the lands in these seven States that now need reforestation.

The States, not TVA, are now providing the seedlings, and they are currently producing, these 7 States, about 500 million seedlings per year. It will take more than that before we complete the reforestation program—which we hope can be done in 7 years.

In the Tennessee Valley itself this will involve working with about 100,000 owners of about a million acres of land. So you see it is a big job. And I am glad to say that the valley States and their forestry departments, their Governors, are cooperating vigorously in this program.

The slogan "Plant Trees—Grow Jobs" illustrates the new understanding of the importance of reforestation and forest improvement in the Tennessee Valley since those early days that I referred to a moment ago. We are planting trees now, not only to hold soil, but to make better use of the rainfall and to provide jobs in the future. Jobs are still a problem in the Tennessee Valley, as they are in much of the Appalachian region, which is forested just as is a large part of the Tennessee Valley.

JOBS IN FOREST

In 1933, when TVA was created, there were fewer jobs related to the forest resource than we have today. Some ties were cut, some

firewood, and some rough timber was harvested and sawed and that was about it.

Now we have about 50,000 jobs that are based on the forests—either in the woods or in industrial plants using the products of the forests. As an example, there are two new papermills in the Tennessee Valley, one started about 1950 and the other about 2 years ago. Those 2 mills alone provide about 2,000 jobs in the plants, and have about a \$12 million annual payroll.

I say we have 50,000 forest-related jobs in the Tennessee Valley now. We think the forests can support about 150,000 jobs, many of them in papermills, furniture plants, lumberyards, plants using wood products of various kinds, making boats and water skis and hammer handles, high chairs—a wide variety of products.

Tree planting so far has been mostly in pine. And typical of the experience with the CCC plantings, an acre of trees planted to pine seedlings will over a period of 45 to 50 years bring an average return of about \$15 per acre per year. The trees are on land which may be worth no more than \$30 or \$40 an acre. So you see there is a good return.

VALUE OF WOOD PRODUCTS

The value of wood products in the valley was about \$300 million in 1940. It is currently about \$500 million with a potential of something over a billion dollars worth of wood products as reforestation continues and forest management improves.

For of course this growth will require more than planting trees. It will take improved management of the forest, better operation of sawmills, the development of industries based on the improved resource.

TVA and the States are working together with landowners and wood users on every aspect of forest management and wood utilization.

PROTECTION FROM FIRE

Improved protection from fire is an important part of the total effort and one phase of forest fire control offers a good example of how TVA programs tie together.

A few years ago the U.S. Forest Service began to investigate the possibility of dropping chemicals on forest fires in the Southeast to control them. TVA worked with the Forest Service to demonstrate that one of the liquid fertilizers which we produce in the chemical plant at Muscle Shoals is also a very good fire retardant. Dropped on burning areas this material will permit leaves and debris on the ground to char, but they do not burn. It can be diluted with water quickly. In tests, planes were loaded and on their way within 14 minutes after notification of the location of a fire and in another few minutes they were dropping this material.

This new liquid fire retardant costs only about 30 percent as much as the chemicals that had previously been used. Beside being effective as a fire retardant, it leaves a fertilizer value after the fire is over, so recovery of the forest is quickened.

Last year the Forest Service tried this material on 13 different fires. In 9 of those 13 cases, the fire was stopped in its tracks; it did not spread beyond the point where the material was dropped. In four

of them it was slowed down, so that when the firefighters got there, sometimes on foot or by boat—it may take hours to get to the site of a forest fire—the fire could be controlled quickly.

Senator HILL. You speak about dropping it—is it dropped from an airplane?

Mr. WAGNER. Yes, sir. They fly over a fire at about 150 or 100 feet. The planes being used now will carry 1,200 gallons of this material, as it is diluted and applied. They drop it right on the edge of the fire.

It was used extensively in March and April of this year, when, you may recall, we had a very bad fire season all over the Eastern United States. For instance, in that period the valley had 3,500 fires, and the average burn, with fire control available now, was only 20 acres per fire. By comparison, in the last bad fire season, which was 1952, there were 2,000 fires, but the average burn was 575 acres per fire, nearly 30 times as much.

REDUCTION IN FOREST BURN

Now, of course, this fire-retardant chemical is not the only method of fire control being used. All firefighting organization and equipment is better in the valley States now than formerly. The forest protection work in the valley is conducted by the States and counties, not by TVA.

In total, the burn in the valley's forests has been reduced from about 10 percent annually in the 1930's to only about a quarter of a percent now. Real progress has been made toward getting the forests in shape where they will provide an increasing number of jobs and better income for the region and for the Nation.

FOREST FERTILIZATION EXPERIMENT

Senator HILL. When you speak of the forests and the trees, what about your tree fertilization program on your phosphate land in Florida?

Mr. WAGNER. We have an interesting program there, Senator, which ties together the forestry and fertilizer programs again. This is research in the use of fertilizers on trees. We are using a tract of about 400 acres of land in our Florida phosphate ore reserve as a field test-demonstration area. The surface of this particular tract is a sand that has almost no plant food value in it, so that we almost have laboratory conditions in the field. We are trying here a considerable variety of TVA fertilizers on eight different species of conifers and hardwoods, varying the times of application, the frequency of application, the method of application, and so on. We will have here an experiment which, for the first time in history, to our knowledge, will provide an opportunity to study the effect of fertilizer over the life-span of trees. This will have real significance, not only in the valley, but for the entire Nation, because if you can increase the productivity of the woods, you can increase job opportunities in the forest and forest-related industries. We would also create a new market for the fertilizer industry. So we are considerably interested in that research project in Florida.

MORE EFFECTIVE USE OF WATER ON LAND

In addition to the work in forestry, there is the problem of obtaining more efficient use of rainfall on farmlands in the valley, and thus

increasing the contribution the water resource makes to agriculture.

As I have said, TVA's early efforts in the fields of agriculture and forestry concentrated on reducing erosion. I am sure you gentlemen will remember the days when TVA was urging the use of phosphate and lime and the planting of legumes so that lands devoted to row crops might be turned to pasture and other soil conserving crops.

KNOXVILLE NEWS-SENTINEL ARTICLE

Senator HILL. In that connection—I do not want to interrupt your thought—but I have here a page from the Knoxville News-Sentinel of this past Sunday, an article by Mr. Powell Lindsay.

North Carolina Farms Quadruple Earnings After Help From TVA. Experiment at Parker Branch Yields "Stunning" Results.

Have you had an opportunity to read this article?

Mr. WAGNER. Yes, sir; I have read that.

Senator HILL (reading):

Net farm income quadrupled. Where 630 man-hours have been needed to produce \$100 net farm income in 1953, only 105 hours were needed in 1961. Land values more than doubled. Grass-covered pastureland held the soil. Good conservation and profitable farming were found to be entirely compatible.

Then he goes on to add that this was no Federal dole project.

I think if there is no objection, we might put this in the record at the conclusion of Mr. Wagner's testimony.

You may go ahead. I do not want to interrupt you.

INTERESTING EXPERIMENT

Mr. WAGNER. That was a very interesting experiment. We are conducting a number of others in various parts of the valley. This one was conducted in cooperation with North Carolina State University. I think this research is particularly significant, because it shows that even in these mountain areas, where so much of the land is producing almost nothing, proper management can both save the soil and, as you indicated with those figures, substantially increase income. The Parker Branch area is about 1,100 acres. When we first looked at it 10 years ago, we found that all the topsoil was gone off a quarter of the land and 75 percent of it was gone off two-thirds of the land. Now, with this experiment completed, we find there has been a 78-percent reduction in the amount of suspended sediment that flows from that area.

In the valley as a whole, Mr. Chairman, since 1933 a million acres have been put into new pasture, and 3 million acres have been taken out of row crops, so that a real assault has been made on the erosion problem in the valley.

LOW COST OF ELECTRICITY

Low cost electricity has helped on the farms, too. As the valley turned to pasture and livestock, the farmers needed refrigeration and running water, and a convenient source of power for many jobs on the farms. Low-cost electricity provided that. I have read the debates when the TVA Act was passed by the Congress, Senator, and the discussions before it was passed. I was impressed by the interest

which you and others took in the application of low cost electricity to improving the quality of rural living. I think you will be glad to know that on some of the better farms in the area now, farmers are using nearly 40,000 kilowatt-hours of electricity a year, which is 4 times as much as the average residential use in the valley, and nearly 10 times the average in the homes of the United States.

IMPROVED FARMING

As time has passed we have found in our agricultural program, as we did in forestry, that we not only could save the soil, but could improve farm income and rural living by improved farm management methods. For instance, in the Tennessee Valley in 1934 only \$110 million worth of farm products were sold. This has increased to \$550 million in a recent year. There are fewer farms now, but they are larger and operated more efficiently.

We have worked in this program with the agricultural colleges, with the fertilizer industry, and with farm groups. Instead of one fertilizer, as we had in our program in the early thirties—triple superphosphate—we currently are working with nine different fertilizers.

Educational programs with the farmers are more complex now than they were in those early days. The problem now is not just to persuade farmers to use fertilizer, but to persuade them to use the right amount, the right kind, and to adopt better management methods on their farms. This very often takes a large dollar investment on their part and they have to be convinced that they can get this money back before they will undertake the risk of investment.

We have another interesting experiment in improving farm income underway in the Elk River watershed in middle Tennessee and north Alabama.

SUCCESS OF TVA FERTILIZER PROGRAM

Senator HILL. Before you leave the question of fertilizers, I can remember—it was a very natural thing—fertilizer companies looked with a lot of skepticism on any Government fertilizer operation. But the years have proved that the TVA operations have been most helpful to the private companies, isn't that true?

Mr. WAGNER. Yes, sir, it is certainly true. The fertilizer program is one that is conducted for the benefit of the entire Nation. It is a program of research to try to find more concentrated fertilizers, materials better suited to the needs of the farmers today. TVA fertilizers are distributed in more than 40 States. I think I have a chart here that you might be interested in seeing for just a moment.

Senator HILL. Suppose you hold that up where Senator Cooper and I can take a look at it.

Mr. WAGNER. This map shows the various States where TVA fertilizer is being used in educational programs of one kind or another.

Senator HILL. How many States?

Mr. WAGNER. Forty-two States in fiscal year 1963. The chart shows the locations as of April 1963. There may be a few that have been added since then.

PURPOSE OF PROGRAM

The purpose of the TVA fertilizer program, as I indicated, is research, development, and demonstration. This is not a commercial operation.

We try to find a new and better fertilizer and then to get it tested on practical farms. This, in turn, creates a demand for it. We expect the private industry to supply that demand.

The processes by which we manufacture these fertilizers are patented, and these patents are available to private industry on a royalty free, nonexclusive basis.

PLANTS LICENSED TO USE TVA-DEVELOPED PROCESSES

Through July 1, 1963, we had issued 352 licenses to 227 firms to use our processes in 335 different plants in about 42 States. This chart shows where there are plants licensed to use TVA-developed processes.

Senator HILL. These are private companies.

Mr. WAGNER. Yes, sir, those are private companies.

Mr. SMITH. Some of them are farm cooperatives, but most are private companies.

Mr. WAGNER. After a fertilizer has been developed and the demand for it demonstrated private companies can use our processes to make the fertilizer, to meet the demand.

SEMINARS AND INSTRUCTION COURSES

In addition to this, we conduct seminars and instruction courses on new developments as they come up. The fertilizer industry, agricultural colleges, and State agricultural departments, send people to us in great numbers.

At one seminar in the valley last January we had 670 people attending from 38 States and 3 foreign countries. They learn from us what we are doing, and we benefit from the exchange with them.

Senator HILL. Do you recall how many of those 600 people were from private companies?

Mr. WAGNER. Yes, sir, there were 228 fertilizer companies represented there, 20 colleges, and 12 State departments of agriculture.

Senator HILL. Senator Cooper?

UPPER CUMBERLAND RIVER VALLEY

Senator COOPER. I hesitate to interrupt and break the chain of Mr. Wagner's testimony, but I do have to go to a meeting. I hope to return in 15 or 20 minutes. I would like to ask, if I can, this question.

I direct your attention to an area adjacent to Tennessee, the upper Cumberland River Valley, with which I know you are acquainted. It is an area which I think was formerly very prosperous because of coal production. Now it is having hard days. It is classed, unhappily, as a depressed area.

It has in addition to coal resources quite an acreage of good land, there is land which could be improved. It has within its confines a national forest, part of a national forest, and it has large possibilities in reforestation. I direct my question to this point.

QUESTION RE TRIBUTARY DEVELOPMENT

Part of your program is tributary development. The Cumberland River is not a tributary of the Tennessee, but it flows through the

area served by TVA, and also on the Cumberland River are dams and a powerplant.

Has consideration been given to including the upper Cumberland River as a possible area for tributary development? I know this could not be served with power. But it would offer greater possibilities to correct the conditions of unemployment, to raise the standards, and to be a great project, to show what could be done with the kind of program that you have been discussing.

Mr. WAGNER. Most of the activities that we conduct—the forest development program, for example—we conduct in cooperation with the valley States including, of course, the State of Kentucky. We would hope that the same practices that are found to be successful in the Tennessee Valley might be extended to all parts of the several States; that there would be a process of spreading. The same should be true of the other programs.

Our fertilizer education program, as I have indicated, is available to all parts of the country.

EXISTING AUTHORIZATION

I believe that under our existing statute there are some things that we do in the Tennessee Valley that we could not do in the upper Cumberland, Senator Cooper. We would like to have our experience utilized to the maximum extent that it can be in solving the problems of that area. We would like to help in any way that we can.

Senator COOPER. I remember one time that I did make some thorough study as I could of the original act—I was of the belief that this area could be included. I think the President also was of that belief.

I am not going to ask you for any direct answer now, because I know you probably could not give it. May I ask if you would—and the Board, Mr. Smith and the Board—if you would look into this matter, find out if you believe your authority would extend to this area, and give consideration to this possibility of a tributary development—not a tributary development, but a development of this area. Could you do that?

Mr. WAGNER. We can take a look at that; yes, sir.

SENATOR MORGAN'S REPORT

Senator HILL. I may say that John T. Morgan, who was for many years Senator from Alabama, who was a great student of waterway development, wrote a very fine report on the development of these two rivers, the Tennessee and the Cumberland Rivers; and he spoke of them as the twin rivers.

Senator COOPER. I am sorry but I have to leave now. I might say Mr. Avedisian called me and asked to testify briefly before this committee.

Senator HILL. We will be happy to hear from him, right after Mr. Wagner.

Senator COOPER. I hope to be back shortly.

Senator HILL. All right. We hope you can come back.

All right, Mr. Wagner.

COST OF FERTILIZER

Mr. WAGNER. I have one more point I might make concerning TVA's chemical fertilizer program, Mr. Chairman.

We believe that the net result of the research and the demonstration that we have done in the field of fertilizer has been more efficient farming, not only in the Tennessee Valley, but across the Nation.

For one thing, it has helped to hold the price of fertilizer down at a time when prices are generally rising.

This chart, for instance, taking 1950 as the index year of 100, shows that by 1962 farm real estate had gone up to about 180 percent, farm wage rates to perhaps 155 to 158 percent, and farm machinery to 142 percent. The price of fertilizer has held almost steady.

I should explain that this red line, which relates to fertilizer, is based on the price of fertilizer per ton. But one of the things we have promoted is more concentrated fertilizers. If you were to look at the price per ton of plant nutrient, instead of the price per ton of fertilizer material, you would find that from 1954 to 1962 the price would have fallen about 16 percent. So the plant nutrients are currently costing farmers 16-percent less than they would have at 1954 prices. And this means a saving of about \$200 million a year to the farmers of the Nation for the price of fertilizer.

This is one of the benefits we believe has resulted from TVA's research program.

Senator HILL. Of course that was one of the biggest problems in the old days—that maybe 85 percent of what was in the fertilizer sack was inert, useless matter. The farmer had to pay for the handling and for the storage and the transportation and all that and yet 85 percent of the material had no value at all so far as the farmer and his crops were concerned; is that correct?

Mr. WAGNER. That's correct.

Senator HILL. Now the percentage of plant food has been greatly increased and the quality improved; is that correct?

Mr. WAGNER. That's correct. I will ask Dr. Nelson to tell you the average concentration of plant food now.

Mr. NELSON. 32.5 percent.

Mr. SMITH. Senator Hill, one of your constituents told me that back 30-odd years ago he had a job in a plant that sold fertilizer, and his job was to put dirt and oil in the fertilizer, so it would get to be dirty and smelly—not to add anything to it.

TRIBUTARY AREA DEVELOPMENT PROJECTS

Mr. WAGNER. Senator Cooper mentioned TVA's tributary area development program. I want to say to you that our programs in agricultural and in forest development—our efforts to increase the efficiency of farms and forests—have been most effective in the organized tributary areas. These are areas of special opportunity, or of special problems, where the people have come to TVA and enlisted our help.

Our programs have been very effective there, I believe, because the interest and the energy and the enthusiasm of the people are enlisted in an organized move. They see the development of agriculture, or the development of their forests, in relation to the total development

of all their resources. And they see resource development as a way to provide more jobs and improved income for their area.

They see the improvement of agricultural income in relation to better business in the towns. They see it in relation to a larger tax base from which the local government can provide improved services in health and education, better roads, and more and better public services of many other kinds.

The tributary area development program which we have described in some detail for you in other years is, I am glad to report, progressing well. We are now working in 13 major areas in the Tennessee Valley. In every area local groups are engaged in surveying their resources, appraising their problems and opportunities. In every area accelerated programs in forestry and agriculture are underway and in every area there are special activities tailored to meet specific situations.

I won't attempt to describe all of the things that are happening.

EXAMPLES OF PROGRESS

Senator HILL. Give us some of the notable examples.

Mr. WAGNER. In one tributary area we are constructing a system of small dams and channel improvements to prevent flooding of bottom land farms, to provide municipal water supply—a water supply needed for irrigation—and to provide recreation and other benefits. In this same area, the local watershed authority chartered under the laws of Tennessee, is now cooperating with the Tennessee State Planning Commission in planning the use of land surrounding some of the small reservoirs that are being built, to be sure that the maximum potential of the shorelines for stimulating economic growth is realized. The people of this area have also planted 30 million trees in a watershed of about 300 square miles, the most intensive job of reforestation in the valley.

The local authority has hired, with its own funds, an executive secretary to help manage their affairs and see that maximum progress is made.

In another case, an adult education program has been undertaken and is well advanced, teaching such things as practical nursing, mechanics, and other skills to equip people for jobs which a survey has shown are available but for which trained personnel were not available.

IUKA, MISS., INDUSTRIAL PARK

A company in Iuka, Miss., has donated 22 acres of land to this same watershed group for an industrial park. In the Bear Creek watershed in Alabama, 300 landowners have gotten together to set up and organize as a shoot-for-fee game management area, a total of 44,000 acres of land. These farmers will plant food for quails and other game, and people who want to hunt there will pay the owners a fee. This is land which is not suitable for farming, but is good hunting land.

Senator HILL. It has been non-profitable in the past.

Mr. WAGNER. That's correct. This is a new source of income. It is one of the kinds of things that these people find available to them when they get down to work with their resources.

ELK RIVER

In another area the State is furnishing \$10,000 a year to match local contributions in the beginning phases of a development program. This is in the Elk River watershed, in which we have launched, in cooperation with the local people, a program to try to double farm income in 5 years. This would add \$28 million annually to farm income in that area.

OPERATION TOWNLIFT

Some of the people in the Sequatchie Valley have undertaken what they call Operation Townlift. The people in one of these towns decided their town needed to be painted and its appearance improved generally. A vigorous group is now at work on the task—a small start but an indication that the people are interested in what they have to offer industry, what they have to offer development programs of one kind or another, what they can do to make their communities better places in which to live. As I stated earlier, one phase of tributary area development work involves taking stock of resources—finding out what forest resources are available; whether they are pine or hardwood; what condition they are in; whether there are any wood-using industries there now and what the potential is for getting some. We call this inventorying the resource base. In the lower Clinch Powell Valley, for example, 122 citizens of the area participated in the preparation of one of these studies.

LOWER HIWASSEE VALLEY

In another area, the Lower Hiwassee River watershed, the organization of a port authority is underway. As a matter of fact, the people in the Lower Hiwassee Valley, probably 300 or 400 of them, are meeting tonight to hear the results of the study that some of their own people have made, with technical assistance from TVA and with help from the State agencies, too.

These examples, Mr. Chairman, illustrate the variety of activities going on in in the Tennessee Valley today—using the tools that are available to provide more jobs and better income for the people.

SHORELINE DEVELOPMENTS

Senator HILL. Speaking about the people, and their efforts on behalf of their towns or communities, their land, what about your shoreline developments, the Melton Hill Reservoir and your Beech River projects.

Mr. WAGNER. Concern for shoreline use is a significant development, Mr. Chairman. We have learned from experience that when we build a reservoir, we in effect create a new resource—the shoreline. We have learned the value of planning for its use. Let me give you a couple of examples.

DECATUR, ALA.

The first main stream reservoir that we built was on the Tennessee, impounded by Wheeler Dam in northern Alabama. A principal city on this reservoir was Decatur. You will recall that in the early thirties Decatur was in the depths of an economic depression as was

much of the country. But Decatur was particularly hard hit because a railroad carshop which had been its principal industry had been closed.

When we first talked with the people in Decatur, they said, "Can't you find us some kind of industry?" And we said we could not produce an industry out of thin air, but there was a great deal that we believed they could do.

Decatur had many physical attractions. It fronted on a new reservoir, so that it had water supply; it had two principal railroads; it had building sites; plenty of good quality labor; but there was no development organization in the city, not even a chamber of commerce.

We started working with some of the Decatur leaders, largely by trial and by chance. We suggested they organize a chamber of commerce and they did. The chamber of commerce was instrumental in having a new milk processing plant established in the city and when the navigation channel became usable, some grain elevators and feed mills came in.

About then the people in Decatur decided that they should not leave their future development entirely to chance, so they went to the recently established Alabama State Planning Board. The Alabama State Planning Board did not have a large staff or much money, but with their leadership the city of Decatur created a city planning commission, and TVA entered into a contract with them to help get some planning done on specific items. For instance, a plan was developed for the use of the waterfront to assure that they would have places for industry to locate. A part of the waterfront lands looked good for a wildlife refuge, and an area was so dedicated.

One of the most important things that the planning commission did was to make a study of the city's finances, and they found that some actions were badly needed to put the city on a sounder financial basis. The results of the actions became assets to the city. Some of the planning done then had to be revised and revised again. Looking back now, we can profit from this first attempt to plan a waterfront along the Tennessee River.

MELTON HILL RESERVOIR

The Melton Hill Reservoir which you mentioned, is a contrasting example of what has developed in the last 25 years. The Melton Hill Reservoir has just been completed this spring on the Clinch River, below Norris Dam in Tennessee.

Now, 25 years later, there were both State and local planning commissions in being. These commissions and many citizens in the cities affected—Clinton, Oak Ridge, and Knoxville—understood what the Melton Hill project could mean to their communities.

Before the Melton Hill project was built TVA got together with the State planning commission, the Oak Ridge Planning Commission, the Clinton Planning Commission, the Anderson County Planning Commission, and the Knoxville Metropolitan Planning Commission and a plan was developed for the use of the shorelines of the future lake.

They identified the areas most suitable for industry and the local governments have now zoned those areas for industry.

They identified the areas that were suitable for public recreation, for county parks and municipal parks. They identified suitable sites and established local public use terminals. They identified areas suitable for residential use. They prepared, in short, a very comprehensive plan for the use of the lands surrounding this reservoir.

The highway and railroad systems were adjusted to fit the plan. With this kind of planning done in advance of reservoir impoundment, boat basins and docks were built in the dry before the reservoir was filled at less cost than if built by using underwater methods, the usual way. The city of Oak Ridge, for instance, built a marina, excavating material in the dry at low cost, and when the lake was filled, the basin was available for immediate use.

PLANNING PROCESS

The interesting thing about this kind of a planning process is that the local people take the new project right into the stream of their economic and government activities so that it begins immediately to make a contribution to the area. This is a lesson that we have learned in the Tennessee Valley. It is one that is applicable anywhere in the United States where dams and reservoirs are built.

BEECH RIVER WATERSHED

The same planning process—you mentioned, Mr. Chairman, the Beech River area—the same planning process that I described for Melton Hill is followed for the land surrounding the Beech River watershed.

As I say, the shoreline is itself a new resource. We have built 21 dams since 1933. We have seen development of the shoreline take place each time one of these reservoirs is filled.

The shoreline furnishes sites for new homes, for recreation developments, and for industries—industries oriented to the use of the new water resource, to the other resources of the area, or to the markets of the area. This new usefulness of the shorelines is reflected in higher values and selling prices for lands.

We recognized this in the 1940's when we began selling shoreline land and found that values had gone up considerably.

STUDY OF LAND VALUES

We recently made some studies to determine to what extent the value of land has increased because it is located on the shore of the reservoir. We made an intensive study of an 18-mile section of the lower regions of Pickwick Reservoir in Tennessee and Alabama and Mississippi. This was an average stretch of reservoir—we tried to pick an area which was typical to the river. Our study deliberately excluded what could be described as the normal rise in land values, because land values were going up generally. We tried to isolate and consider only the effects of location on a waterfront.

We sold about 4,000 acres of this land between 1947 and 1960. We found that it sold for six times as much as we had paid for it in the late thirties. The average purchase price was \$20 an acre, the average selling price was \$120 an acre.

RETAINED OR TRANSFERRED LAND

Perhaps another 10,000 acres in that area is being retained by TVA for program purposes or has been transferred to State or local agencies for their development for recreation purposes.

If all the land is included, both that retained and that transferred and sold—the value increased about four times. The purchase price averaged \$20 an acre; its value when sold as waterfront property was about \$84 an acre.

Isolated examples can be found that are quite extreme. I know of some instances where land was bought for about \$100 an acre and was sold as lots for cabinsites and homesites for several thousand dollars an acre.

ENHANCED VALUE OF LAND

This enhancement in value is created entirely by the public investment in the dams and reservoirs. While the increase in value has been dramatic we have found that a substantial part of the increase has been lost to the local economy because of inadequate planning for the use of reservoir lands. Lands which are needed for industry, for example, have been directed to other uses and areas which could provide prime residential or recreational sites have become unavailable for such purposes. In the Beech River area we are trying to demonstrate one method of insuring that the land surrounding the reservoirs will make the greatest possible contribution to the economy of the region. We hope to demonstrate also that it is feasible to capture the enhanced value of that land and thus help pay for the cost of the project which created the enhancement.

This is the way it works. For our Beech River project we have bought land around the shores of the small reservoirs which is being turned over to a local watershed authority chartered under the laws of the State of Tennessee. The local agency will manage it in accordance with plans we are developing jointly with the State planning commission and the local people, and this agency will sell, lease, or license it for recreation, for homesites, for industries, and so forth. Income from the disposal or use of the land will be added to other revenues which they will have from the projects, and will be used to repay about \$2 million of the cost of the development.

RECAPTURING THE ENHANCEMENT

The problem at Beech River is relatively simple. It is a small scale project in a single State. The precise method to be used to insure that the land adjoining the reservoirs will make the maximum possible contribution may vary from one area to another, from one project to another, but we believe that the basic principle is sound, and that it may have further application in other areas. There is no doubt that the shoreline developments which are certain to materialize will add importantly to the strength of the local economic base. They set the stage for more jobs, for greater productivity, for increased incomes, and for better living.

The projects built in TVA's early years have made a great economic contribution to the region and to the Nation—there can be no doubt about that.

We believe that as projects are built in the future, shoreline planning can produce a more immediate economic impact. It will speed

results and insure the future in a way that would not be possible if the importance of shoreline development were not recognized in local economic planning as a new resource on which to build.

BENEFITS FROM OLDER RESERVOIRS

Senator HILL. Speaking about your present projects, Mr. Wagner, and looking to the future, what can you do about your older and larger reservoirs, so far as getting any enhancement or benefits from these shorelines?

Mr. WAGNER. Most of TVA's shoreline lands have been sold. In some instances, local agencies are now purchasing lands and setting them aside for productive future uses. Communities are zoning the waterfront lands and we believe that their potentialities can be preserved, Mr. Chairman, through such methods, applied to the extent that you can apply them now.

Senator STENNIS. Mr. Chairman—I am going to have to ask to be excused. There is a matter on the floor that I must attend to.

Senator HILL. Well, since I cannot be there, I do not know of anybody I would rather have there than you, sir. I am delighted you are going to be there.

Senator STENNIS. Glad to have seen you gentlemen again.

Senator HILL. Let me ask you this.

PAYMENTS IN LIEU OF TAXES

You spoke about your States and your local communities. Are they recognizing these values, reflecting the change in economy in their tax structures, thus realizing revenues to increase their share in the common resource development programs?

Mr. WAGNER. Senator, as you know, the TVA power system itself and the distributors of TVA power, both municipalities and cooperatives, make substantial payments in lieu of taxes and which reflect in themselves the economic growth of the area.

For instance, in 1963, the fiscal year just passed, TVA's payments in lieu of taxes to States and counties were something over \$7 million, and the distributors of TVA power paid about \$13 million, making a total of more than \$20 million paid into State and local treasuries from the region's power system.

TVA makes such payments at the rate of 5 percent of its gross power revenues excluding revenues derived from the sale of power to the Federal Government. The distribution systems make payments which are generally based on the value of their properties.

The payments from the electric system as a whole have increased to a greater extent in the TVA area since 1937, when a large part of the area now served by TVA was served by private utilities, and State and local taxes paid by electric utilities have increased in the United States as a whole. For instance, during that period there has been a 554-percent increase in State and local tax or in-lieu-of-tax payments in the TVA area as compared with a 444-percent increase in State and local taxes paid by power suppliers in the United States as a whole.

TAX REVENUES OF STATES

People on our staff are in touch with the States in regard to these in-lieu-of taxpayments and their distribution so we know something

about tax revenues of the States and communities, but we have not made a comprehensive study of them. We do know that the tax structures need revision to suit the kind of an economy we are moving into, an industrial economy as contrasted with an agricultural economy. Members of the TVA Board on various occasions have called the attention of people in the region to this need for change.

We are very sure that the taxable wealth has increased.

BEECH RIVER PROJECT

In Beech River, we have the only example that I can cite for you where the increase in tax revenues due to increased values resulting from a public project will be used to help pay the cost of the project. The counties and cities involved in the Beech River development will make annual payments to the local watershed authority derived from increased tax revenues from land protected from flooding, and increased taxes from the new developments that will take place on the shores of these small lakes. Those increased tax receipts will be paid in part into the watershed authority, then to TVA, then to the Federal Treasury, to help pay the cost of the projects.

INCREASED EXPENDITURES FOR RESOURCE DEVELOPMENT ACTIVITIES

Now, to respond to the other part of your question.

Since the beginning of TVA, there have been very substantial increases in the expenditures of the valley States for resource development activities such as parks, fish and wildlife, forestry, agriculture, and so forth.

In 1934, the valley States were spending only \$8 million in total. In 1962, the amount had risen to \$137 million. In the last decade, to take a single example, the State of Kentucky has tripled its gross expenditures for park and forestry activities from \$4 million to \$12 million a year.

In 1962 the per capita expenditures of State and local governments in the Tennessee Valley region for resource and related activities were \$5.41. The national average is \$5.36. Since 1933 State and local expenditures for resource development have risen from far below the national per capita expenditure to a little above it.

When you consider further that the per capita income in the Tennessee Valley is only about two-thirds of the national average, this is all the more remarkable. And it does indicate that efforts are being made by State and local governments to increase their activity in this general field and their financial support for it.

Senator HILL. So they are definitely going forward.

Mr. WAGNER. Yes, sir.

STREAM POLLUTION

Senator HILL. Mr. Wagner, recently we had before us in the Senate what we call the water pollution bill. What can you tell us of what TVA has done in this matter of stream pollution abatement?

Mr. WAGNER. This has been an area of considerable concern to TVA, Mr. Chairman, and we have been working at it for some time. Prior to 1933, most of the cities in the Tennessee Valley discharged raw sewage into the rivers and so did the industries. In fact, as far as

industry was concerned, about the only use that they made of the river was as a means of waste disposal.

No single valley State had pollution control legislation.

TVA ACTIVITY

In 1936 TVA undertook some surveys of water quality and the identification of pollution sources, and as this information became available, we discussed it with the State government. As time went on, the region became more and more aware of the importance of a good supply of clean water to its economic future. The region has begun to correct some of the deficiencies of the early days.

Between 1945 and 1957 all seven of the valley States enacted comprehensive pollution control legislation. In 1958, you may recall, Federal approval was given to an interstate compact for pollution control. So far the States of Tennessee, Mississippi, and Kentucky have ratified the compact. The other four have not, but a start has been made.

There are other marks of progress.

TREATMENT PLANTS

In 1950, only 68 of the cities of the valley had treatment plants. Ten years later, 102 had sewage treatment plants and 17 of those that had them in 1950 had made major improvements. There are still some problems to be corrected and a number of corrective actions are scheduled. We believe that by 1975 all of the cities in the Tennessee Valley will have adequate treatment for sewage before it is discharged into the rivers.

The new industries being established in the valley are under the control of the State pollution control boards and the wastes which they are discharging are in general being properly treated.

PROBLEM PRESENTED BY OLDER INDUSTRIES

The older industries, established before there was pollution control legislation, present a somewhat tougher problem, but one on which work is being done. We believe that if the citizens of the area continue to press for clean water, the States, with some assistance from the Federal Government, can protect the quality of the water in the Tennessee Valley and even further improve it. As you may know, the quality of water in the Tennessee Valley already is substantially better than the average throughout the Nation. We want to be sure it is kept that way.

Senator HILL. And you have made real progress to that end, have you not?

Mr. WAGNER. Yes, sir; we have.

Senator HILL. Well, of course, as we have said before, there are no funds in this budget for any power facilities, is that right?

Mr. WAGNER. No appropriation.

QUESTION OF KEEPING POWER COSTS DOWN

Senator HILL. No appropriation for power facilities.

I would like to have a little report at this time, though, since we have reviewed some of the other programs, of what TVA has done,

we might say, to continue to achieve economy in the power program, to promote the wide use of electricity, and to accomplish the objectives which we set out in the original TVA statute.

In other words, we would like to know what you are doing to keep the costs down.

I see our longtime friend, an expert in power, Mr. Wessenauer, is here. Would you like to come around here?

STATEMENT OF G. O. WESSENAUER; COST OF LARGER GENERATING UNITS

Mr. WESSENAUER. Thank you, Mr. Chairman.

One of the things we have done to keep the unit cost down is to use larger steam-generating units. You may recall that in 1951 we installed 112,500-kilowatt machines at the Johnsonville plant. We moved up to 200,000-kilowatt units at the Kingston, John Sevier, and Colbert plants; then to 250,000- and 275,000-kilowatt machines at Gallatin. Then we progressed to 500-megawatt machines at the Widow's Creek and Colbert plants in north Alabama. We just recently placed in operation our second 700-megawatt machine at Paradise, which is the plant in the coalfields in western Kentucky.

We have under construction the Bull Run plant in east Tennessee, the first unit of which will have 900,000-kilowatt capacity.

The significance of using larger units, based on our studies of costs of building plants today, is that the 900-megawatt machine will cost about 25 percent less per kilowatt to build than would be true if we were building plants with 200-megawatt machines in them.

When we turn to operation and maintenance, we find that at a plant with 900-megawatt units the cost per kilowatt-hour, exclusive of fuel, will be about a third of the cost of operation and maintenance per kilowatt-hour at plants with the smaller units.

IMPROVING HEAT RATE OF STATION

We have also moved forward in improving the heat rate of the power stations, that is, we are now producing a kilowatt-hour for less coal. For example, the John Sevier plant takes 9,200 B.t.u.'s to produce a kilowatt-hour. We have moved down to 8,800 B.t.u.'s per kilowatt-hour at some of our newer plants. At Bull Run, where we are going to supercritical pressures, the heat rate will be reduced to about 8,400 B.t.u.'s per kilowatt-hour. This means a large saving in the amount of coal required to produce a kilowatt-hour.

TRANSMISSION

On our transmission system, where we will be handling larger quantities of power, we are stepping up our transmission voltages from 161,000 volts to 500,000 volts on new lines which we are building between Johnsonville and Memphis, and from Widow's Creek to Huntsville, Ala., and down to West Point, Miss. Here the significance is that we can transmit a kilowatt-hour on the higher voltage facilities, when they are fully loaded, for about half what it would cost us with 161-kilovolt lines.

We also have realized a reduction in cost in the procurement and transportation of our fuel. Because we are a large market for coal—we purchase and burn something over 20 million tons of coal a year—

we provide a continuing and substantial market for the coal producers and for the railroads and bargelines, which transport the coal. Therefore, based upon long-term contracts with TVA, they can more readily make improvements in their operations which will increase the productivity of their labor and equipment and enable them to deliver the fuel to us at a cheaper rate than would be true if we were buying only a few carloads of coal. Thus we have been able to maintain favorable fuel costs.

TRANSPORTATION OF FUEL

In the transportation of our fuel we are working extensively with the railroads toward using the unit train. This is an arrangement in which a train will be devoted exclusively to the transportation of coal between a producing area or a mine and one of our plants. By arranging for quick unloading of the coal train, the railroad is enabled to take its train back the same day and thereby reduce the amount of idle time. Therefore, they are able to quote lower rates than would be true if we were handling smaller quantities of coal or using less efficient arrangements.

CONTRACTS WITH OTHER COMPANIES

Another kind of effort is our work to keep the load on the power system built up through interchanging power with some of our power company neighbors. As you know, Senator, a year or so ago we completed contracts with Mississippi Power & Light Co. and associated companies whereby large quantities of power will be exchanged between them and us on a seasonal basis. Because our loads are heavy in the wintertime, due to electric heating, and lighter in the summertime, we have idle capacity in the summertime which we can make available to these companies. They, in turn, have a high load in the summertime, primarily because of air-conditioning loads on their systems. During their lighter load periods in the winter they have power which can be supplied to TVA. Under our new contractual arrangements we will be supplying them power in the summertime, loading up our facilities; they will be returning the power in the wintertime, loading up their facilities. Between us we will be able to avoid the installation of over 3 million kilowatts of new capacity. On our own system this amounts to a million and a half kilowatts, which would otherwise cost us around \$200 million.

That will not be a net saving since we will have to spend money for the interconnecting transmission lines, but there will be an economy which will enable us to supply power to the Tennessee Valley region at lower cost than would otherwise be possible.

USE OF COMPUTER

We are using our computer to help us load our system in the most economical way. From hour to hour, we feed into the computer the information as to the load conditions on the system, the availability of various sources of generation, the characteristics of our transmission lines, and the losses that may be encountered in handling various quantities of power. The computer enables our dispatchers to advise each plant for every hour as to the most economical loading. We thus

produce the kilowatt-hours supplied from the power system for that hour at the lowest possible cost.

POLICY DIRECTION FROM CONGRESS

The extent of these economies would not be possible except for the policy which Congress specified in the Tennessee Valley Authority Act and which I believe we have faithfully carried out. We were to make this power abundantly available to the people at the lowest possible cost. The results are reflected in the fact that the people in the Tennessee Valley area now use over 10,400 kilowatt-hours annually on their farms and in their homes as contrasted with the national average of a little over 4,200 kilowatt-hours per year.

INCREASED USE OF POWER

The use of power by business and industry has also increased. The people's use of these large quantities of power has helped make economically feasible the building of these large generating units and these high voltage transmission lines, and the purchase of these large quantities of coal so to effect the economies of large-scale production and transportation.

Volume use of power is of great significance in bringing about low unit costs. I can illustrate this very simply in one element of distribution. In order to supply power to a home, the distributor has to put a line from the pole into the house and he has to connect up a meter. Now, those facilities cost a certain amount of money. But if the customer uses 10 times as many kilowatt-hours over that facility, the unit cost is one-tenth of what it would be otherwise. Volume has been a great factor in enabling TVA and its distributors to keep unit costs low.

OPERATIONS OF DISTRIBUTORS

The operations of our distributors have been remarkably successful, and progressively over a period of time many of them have been able to reduce their rates. This, in turn, has encouraged their consumers and the members of cooperatives to use more power.

RATE REDUCTIONS

Last year, there were retail rate reductions yielding over \$1½ million in savings to the customers for that year. During this fiscal year, up to the present moment, the savings from further reductions are almost another million and a half dollars.

I think you may recall, Senator, less than 3 years ago we proposed for the use of our distributors a new and lower retail rate schedule. Since this occurred on Senator Norris' 100th anniversary it is known as the Norris centennial rate. There are now nine distributors which use that lowest rate. The introduction of that rate was a spur to further activity in rate reductions—there have been savings of almost \$4 million a year in rate reductions made subsequent to the announcement.

I think that may give you some idea of some of the things that are being done in bringing low-cost power to the people of the Tennessee

Valley region, to help them in their economic growth and development, and to a better living in the Tennessee Valley.

It has been a challenging and rewarding experience to work there.

Senator HILL. Of course we have factors today we did not know about when we wrote the act. No one at that time thought in terms of air conditioning.

FLEXIBILITY PROVIDED BY ACT

Mr. WESSENAUER. That's right, Senator. There have been a lot of new developments. I think that the Congress is wise in giving latitude to the organization in carrying out its assignment, flexibility to meet new situations and new opportunities.

Senator HILL. I am glad that you mentioned that because I think that is true. I think one of the reasons, one main reason for the success that TVA has attained, has been that the act did give this flexibility to its Board. Isn't that true?

Mr. WESSENAUER. That's correct.

Senator HILL. They have the flexibility to meet the different situations as they arise and take advantage of every opportunity to bring about economy and efficiency and better service for the people of the Valley and for the Nation. Isn't that right?

Mr. WESSENAUER. That's right. Not only that, but the power program is a part of a whole multipurpose regional development and all of the activities of TVA are working together to help bring this about. I do not believe the power program could be what it is today if it were not for these other programs. And I think the power program in a way has helped to further the other programs.

This is an organization of great cooperation and working together, getting a job done.

RETURNS TO TREASURY

Senator HILL. Mr. Wagner, you made some right nice returns to the Treasury, too, have you not?

Mr. WAGNER. Yes, sir.

Senator HILL. How much are you paying this year?

Mr. WAGNER. Last year's payment from power proceeds was \$48,875,000 and we estimate that in the current fiscal year, we will pay a little over \$50 million.

Mr. WESSENAUER. We have paid into the Treasury a total from power proceeds, Senator, of almost \$400 million. About \$117 million of that was as a return, a dividend, on the appropriation investment in the power system. About \$280 million was paid as a reduction of the appropriation investment or to repay that portion of the capital provided by the issuance of bonds in 1939. They were held by the Treasury.

Senator HILL. But you have made these payments from power proceeds?

Mr. WESSENAUER. Yes, sir.

NUMBER OF VISITORS

Senator HILL. You have many visitors there each year.

Mr. WAGNER. Yes, sir; we have a great number of visitors both from the United States and from foreign countries. Between 2,000 and 3,000 people from foreign countries come to see what TVA is

doing every year. Some stay for a day, some stay for weeks. We again are glad if our experience can be used by people in helping to solve problems in their own countries.

Senator HILL. Of course, your fame is worldwide.

OBSOLETE FACILITIES

Speaking about visitors, I was a visitor at the TVA chemical plant not too long ago. I saw some pretty old, obsolete facilities that had been built many, many years ago, some even dating back to the old days when we did not speak of the TVA, because the TVA had not been born. It was Muscle Shoals then.

I have some pictures of those old, obsolete, now useless facilities. It seems to me they ought to be torn down. I wish you would take a look at them, Mr. Wagner.

Mr. WAGNER. Yes, sir; I know about these.

Senator HILL. Have you seen them?

Mr. WAGNER. Yes, sir; I have seen them.

Senator HILL. Would you concur, Mr. Smith?

Mr. SMITH. Yes, sir.

Senator HILL. How about you, Mr. Wessenauer?

Mr. WESSENAUER. I am glad to say they do not look like power facilities.

Senator HILL. I think it was estimated that it would take about \$800,000?

Mr. WAGNER. I think that's about right; yes, sir; to clean up some of those old World War I plants, and some of the subsequent ones that are no longer in use.

Senator HILL. Not of any value at all.

Mr. WAGNER. Maybe a little scrap value, that's all.

Senator HILL. I see. Have you found a new method for the use of scrap?

Mr. WAGNER. Not a new one, but there are still old ones.

Senator HILL. Well, it does look like they ought to come down—there is no doubt about that.

Anything you would like to add, Mr. Smith?

Mr. SMITH. No, thank you, Senator.

Senator HILL. Anything you would like to add?

Mr. WAGNER. No, sir.

(The newspaper article previously referred to by Senator Hill follows:)

[The Knoxville News-Sentinel, Nov. 17, 1963]

EXPERIMENT AT PARKER BRANCH YIELDS "STUNNING" RESULTS—NORTH CAROLINA FARMS QUADRUPLE EARNINGS AFTER HELP FROM TVA

(By Powell Lindsay)

"You see that field down yonder?" the overalled farmer said with a smile. A fall wind rippled a beautiful stand of grass, and a good sized herd of cattle grazed contentedly.

"Ten years ago, there were gullies in that field that you could drive a bus through. I didn't think anything would ever grow on it. It was just throwed-away land."

That farmer lives in a little valley in western North Carolina, the Parker Branch watershed.

He and his neighbors and his valley are part of an experiment that began with an effort to see how planting pasturelands reduced erosion, and ended with a tremendously significant 10-year study of mountain farming.

APPALACHIAN FARMS CAN THRIVE

Many people and particularly economists have long despaired of the Appalachian farmer. This study proves that the mountain farmer can make it if he runs his farm intelligently.

Ten years ago the farmer who looked out over the steeply rolling pastureland was like most other Appalachian farmers: barely scraping an existence out of a land-poor 35-acre farm, seeding what land he could by hand, planting what his father and grandfather planted.

But then "the project" came.

The project involved TVA and North Carolina State College. Those two institutions got together and decided they'd see if anything could be done about the small farmer in the southern Appalachians. Then they looked around for a good "laboratory."

They decided on the Parker Branch watershed, a 1,000-acre stream valley in western North Carolina, about 6 miles from Asheville in Buncombe County.

For 2 years, agricultural economists studied the farming habits of Parker Branch farmers. Then for the next 3 years, the farmers themselves changed those habits, spent money improving their farms, adjusted to new techniques, set up long-range plans.

Then for the next 4 crop years, the results were studied.

RESULTS OF PROJECT "EXCELLENT"

Last week, those findings were revealed. They are stunning.

Item: Net farm income had quadrupled.

Item: Where 630 man-hours had been needed to produce \$100 net farm income in 1953, only 105 hours were needed in 1961.

Item: Per acre crop yields had skyrocketed—alfalfa up 117 percent, silage and grain corn up 60 percent, the valuable cash crop, tobacco, up 50 percent, wheat up 25 percent, pasture yields up 100 percent.

Item: Land values more than doubled. Grass-covered pasturelands held the soil. Good conservation and profitable farming were found to be entirely compatible.

This was no Federal "dole" project. True, TVA spent an average of \$2,500 a farm in bulldozing over gullies and clearing scrubby land and providing fertilizer and seed.

But the farmers themselves spent an average of \$4,500 each—of their own money—in revamping their farms and their farming methods. This went for new equipment, new buildings, new livestock.

REPORT IS WELL TIMED

And in figuring up the net farm income, TVA listed the "public money" spent on each farm as a loan to the farmer.

Even so, the figures showed that each farmer's net farm income was four times what it was 10 years ago. And his land was worth twice as much.

The final report on this project comes at a dramatic time: Right in the middle of a trip through this area by Commerce Under Secretary Franklin D. Roosevelt, Jr., who heads a Commission which will soon submit to President Kennedy a plan for a massive program to pull the Appalachian area's economy up by the bootstraps.

Mr. Roosevelt and staffers of the President's Appalachian Redevelopment Commission are on a 10-day tour of the Appalachian area, of which Parker Branch is a typical agricultural part.

The Under Secretary was in Knoxville Wednesday. He'll be in Asheville this week, and he'll be fully briefed on this report. But as a matter of fact, he already knows a good deal about this experiment.

Dr. C. E. Bishop, head of North Carolina State's Department of Agricultural Economics, said the Roosevelt Commission's plan will include a cost-sharing provision patterned after the Parker Branch experiment.

This would involve Federal grants to farmers who invest some of their own money in renovating their farms and updating agricultural methods.

FARMERS PRAISED BY TVA LEADER

"This report and this experiment loom much higher in importance than we ever dreamed when we started," said Dr. L. B. Nelson, TVA's manager of agricultural and chemical development. "Appalachia has become a problem area, and the whole country is concerned with it.

"You people," he told the Parker Branch farmers at the final report meeting held Tuesday near Asheville, "have pointed out directions we can go, and you've created a lot of interest all over the country.

"Mountain farming is faced with serious difficulties," Dr. Nelson said. "Improving the agriculture in the mountain areas is only one corner of the overall economic problem of the mountain area.

"But we believe that we have shown here that mountain agriculture can be raised well above the subsistence level and that it is worth the investment on the part of both the farmers and public to see that it is done. Improved agriculture does have a role in the improvement of the overall economic situation in the eastern mountains."

Parker Branch was once a prosperous agricultural community. Only eight families lived in the valley, and the farms were big. Some 75 years ago, hay was a big cash crop. That was before the automobile. Grain was a cash crop, too, because local flour mills used it to grind into flour. But the Nation's "breadbasket" moved to the Midwest.

Times began to worsen, gradually. And as generations passed, big farms were divided into smaller ones as fathers left the land to sons.

LAND ABUSES CUT PROFITS

The reaction of the farmers to these changing times was simply to tighten their belts and hope for "better times." Better times, of course, did not come, any more than the horse would return to replace the automobile.

By 1952, the 1,060 acres were divided into 49 farms. The land was abused and eroded, the buildings and machinery deteriorating. Some people left, but because they weren't trained for anything but farming, they fared little better in the cities.

The Parker Branch experiment was divided into three parts. The first—from March 1953 to July 1955—was the "calibration" or study phase.

During that time, agricultural economists studied in detail every aspect of farming in the Parker Branch watershed. They gathered data on soils, rainfall, runoff, the type, size, and value of all physical assets, records on revenues and expenses, credit experiences, input-output data on all farm production, the availability and type of hired labor, the background of available nonfarmwork in the area—the works.

All this information was fed into computers, and out of the computers and from the personal knowledge of the economists came from two to five alternate plans for each farm.

These plans were discussed with each farmer, and tailored to fit his wishes and suggestions. These alternatives included full-time farming, part-time farming, and full-time nonfarmwork.

Phase 2 was the "action" phase, lasting until the spring of 1958. During this time, the farmers modernized their agricultural techniques and followed the long-range plan they had selected.

Phase 3, lasting for 4 crop years, ending in the fall of 1962, comprised the "evaluation." All the data gathered was then compared with that gathered in the study phase of 1953-55.

The project came in for a good deal of criticism when it was begun.

PROJECT DREW SOME CRITICISM

Many claimed that improving the lot of the mountain farmer was impossible. Others chided that, "You're going to help those farmers stay on that land, when, in fact, they should leave it and get new skills." Neighboring North Carolinians sneered that the whole scheme was "politics."

The experiment proved, however, that mountain farmers, when they run their land intelligently, can indeed make a good living.

On the charge that the experiment would persuade farmers to stay on the land when they should leave, the figures show otherwise. More people abandoned

farming in the Parker Branch watershed than in the rest of rural Buncombe County.

The "politics" charge, never adequately explained, has been forgotten.

Here's a breakdown on the money spent on the Parker Branch experiment:

Capital investment

Type of asset	Source of capital		
	Private	Public	Total
Land use.....	\$23,222	\$101,436	\$12,658
Livestock.....	50,880	-----	50,880
Farm buildings and machinery.....	32,910	-----	32,910
Machinery and equipment.....	79,102	-----	79,102
Total.....	186,114	101,436	287,550

TVA says it advanced the money for the land clearing, fertilizer, and seed in order to "telescope time." Otherwise, the experiment would have taken about 15 years. But, remember, the income totals are figured with the public expenditures included in the private expenses.

To make this improvement in income all the more remarkable, the rise came during a period of falling farm prices and rising prices for the things farmers had to buy.

Neither TVA nor North Carolina State is kidding anyone, however. They know that the day of the 30-acre farm is vanishing. As farm technology increases, the farmer simply must have more land in order to operate efficiently.

SIZE OF FARMS MUST EXPAND

"The real value of this program was in getting these people to want to do new things," said Dr. Nelson. "If they begin to think of new ideas themselves, the quicker and less painful the inevitable change must be."

Bob Ray, formerly a North Carolina State agricultural economics research instructor and now a U-T agricultural economics professor, said the planners know there are some farmers in Parker Branch who will not maintain the pace of improvement now that the TVA and North Carolina State planners are leaving.

"But we feel that the ones who are making it good now will expand into the land of the ones who won't, and the talented farmers, with more land to use, will do even better," Professor Ray said.

What happens to the ones who just don't have the talent?

"They're generally the older ones," Mr. Ray replied. "There's very little we can do for them. They'll probably just become welfare cases. But they can at least get some revenue by leasing their land to other farmers."

The average family income in the Parker Branch watershed—from all sources, farm and nonfarm—is now about \$4,400 a year. It was only about \$3,000 10 years ago. But TVA feels that even this new rise is held down by people who one day soon must abandon farming altogether. When this happens, and knowledgeable farmers take over the land, the per family income will go higher.

That's already happened inside the watershed. Where there were 49 farms 10 years ago, there are 41 today. Further consolidation will occur, planners believe.

CONSERVATION GAINS SPREAD

And the good farming practices, careful planning and "spending money in order to make money" philosophy has already spread outside the watershed.

"You used to be able to drive down a road on the watershed boundary and you'd see a striking contrast from one side of the road to the other," one TVA staffer said. "The watershed side would be cleared and producing, while the other side would still be severely eroded.

"But now other farmers are doing what the Parker Branch ones have done. They're reclaiming land and conserving it, too."

Echoes from Parker Branch:

G. L. Roberson, farmer and farm equipment dealer: "I had about 35 acres when the project started. And a lot of that was just holdin' the world together. There was nothin' growin' on it.

"Then I bought 12 more acres and paid \$1,200 for it. Two years later, I bought another 12 acres. This time I had to pay \$2,500 for it."

Herman Bridges, farmer: "I remember one night (North Carolina State Prof. A. J.) Coutu came to my place and asked me, 'What are your plans for the next 10 years?'"

Mr. Bridges chuckled as he recalled the interview. "'Well,' I said, 'I might have an idea when I go to bed, but when I wake up I'll have changed my mind.'"

"'No, no,' he said. 'You've got to have a program.'"

"'Well,' I said, 'I'd always sort of thought about going into the dairy business.'"

"The next thing I knew, I was in the dairy business. He helped me plan it and everything."

PASSES UP FACTORY JOB

Cal Cook, farmer: "I would have been in a factory somewhere, if it weren't for the project. But I don't want to work in a factory. I want to farm."

Cal Cook is one of the few full-time farmers in the watershed. He's got a good dairy business and he's making three times the money off his tobacco allotment than he did 10 years ago.

G. Wiley Brown, farmer: "I've heard since I was a child that if you feed the land, it'll feed you. But I got to believing that I'd took hold of something I couldn't afford to keep up.

"But these people"—he nodded to TVA and North Carolina State officials—"helped us farmers with limited funds and, yes, limited know-how, develop what had been a part-time operation into a full-time one.

"They gave me a chance to do what I've wanted to do all my life: To see a place which wasn't growing anything turn into a place that was producing."

REMARKS BY SENATOR HILL

Senator HILL. Would anyone else like to add anything?

Well, I think this has been a very fine, informative period. I want to express my appreciation to you, Mr. Wagner, and to you, Mr. Smith, and to you, Mr. Wessenauer.

Mr. SMITH. Senator Hill, Mr. Jones has had a conflicting engagement which made it impossible for him to be here. It was impossible to change at the last minute.

Senator HILL. Well, we would have been happy to have had him here, and you tell him I understand fully why he could not be here, but his cause was beatifully presented. You gentlemen certainly did make a very fine and most interesting and informative presentation here today—very fine indeed. We want to thank you for it.

Now, Mr. Stubblefield, would you like to come around, please, sir?

Mr. STUBBLEFIELD. Senator, I won't take but just a moment.

Senator HILL. All right, sir, do you want to make a little statement?

Mr. STUBBLEFIELD. I want to make a little speech to you.

Senator HILL. Proceed, sir.

STATEMENT OF HON. FRANK A. STUBBLEFIELD, A REPRESENTATIVE IN CONGRESS FROM THE FIRST DISTRICT OF KENTUCKY

SUPPORT OF REQUEST

Mr. STUBBLEFIELD. Mr. Chairman, the people in western Kentucky know of your longstanding devotion to TVA and the great contribution you have made to TVA. We are most appreciative of

your efforts over these many years. In fact, some of the boys, like Mr. Wessenauer, Ed Wagner, Jo Swidler, I think he has gone elsewhere—brings back memories of when we were trying to get this thing started. It was my good fortune to be on the city council of my hometown of Murray, Ky., which was the first city in Kentucky to have acquired TVA power. And I just want to say—

Senator HILL. That was Alben Barkley's old congressional district.

Mr. STUBBLEFIELD. Yes, sir; and we have never regretted for a moment having taken that step. We certainly want to thank you for your assistance during those trying days.

Senator HILL. Thank you, sir, but I want you to know we are very proud and happy to have you here, Congressman.

Mr. STUBBLEFIELD. I have Mr. Michael Avedisian with me from Paducah, Ky., who would like to make a statement in regard to the land acquisition policies of TVA as they pertain to the proposed recreation area which TVA has undertaken to develop between Barkley and Kentucky Lake.

Senator HILL. We are glad to have you, Mr. Avedisian.

STATEMENT OF MICHAEL AVEDISIAN, ATTORNEY AT LAW, PADUCAH, KY.

CLIENTS REPRESENTED

Mr. AVEDISIAN. Mr. Chairman, I am Michael Avedisian, attorney at law. I reside in Paducah, Ky., admitted to practice in the States of Kentucky and Illinois, the sixth, seventh, eighth, and District of Columbia U.S. circuits and the Supreme Court of the United States.

A few of the clients that I am representing and appearing in behalf of before this committee are—and I don't have the list with me—just a moment, please.

Senator HILL. Do you have some extra copies of your testimony, sir?

Mr. AVEDISIAN. No, I do not, Mr. Chairman. I got through at 4 o'clock in the morning writing this, and I have been up all night.

I represent the Presbytery Conference Center comprised of some 8,000 members, which owns 35 acres in this area Between the Lakes.

I represent Mr. William Paxton Smith, owning 2 acres in 2 lots. Mr. French Helsly, 2 acres and 2 lots. W. P. Hall, M.D., 2 acres in 1 lot. James Harris, M.D., 18 acres in 30 lots, 23 of which are waterfront. W. J. Colburn, M.D., 9 acres.

Senator HILL. Why don't you just file that for the record?

Mr. AVEDISIAN. I just have a few here, and I will be glad to file additional ones. Theodore Marr, M.D., 2 acres, Amos V. Calhoun and L. W. Sherrett, 40 acres in 95 lots. J. L. DeWese, mayor of Grand River, 2 acres in 2 lots. Lee F. Powell and Boise Moody, 164.2 acres. Russell Badgett, 100 acres.

I own a few lots myself.

C. C. Christian owns 57 acres, John O'Brien, ex-mayor of Grand River, and C. C. Christian own 25 additional acres into 19 lots. And lastly, H. Norman Sullivan, who owns 2 acres.

Because of the lack of time, I have not made a further complete list, and I will be happy to mail it to the committee upon your request.

Senator HILL. We will be happy to have the full list, and we will have the full list made a part of the committee's record.

REASON FOR APPEARING BEFORE COMMITTEE

Mr. AVEDISIAN. Our purpose for coming before this Subcommittee on Public Works of the Senate Appropriations Committee is to ask this committee to restrict the boundaries of the condemnation in the between-the-lakes area within the appropriations act itself.

The total area over which TVA seeks jurisdiction is approximately 174,000 acres according to their latest press releases.

REQUEST OF COMMITTEE

I am asking in behalf of my clients that an area of approximately 4,000 acres of the total of 174,000 acres be left in private ownership for the purpose of use, occupancy, and enjoyment of their homes, farms, and to permit private development of this area which we believe is necessary to the economic growth and development of the counties and of the adjacent communities.

Further, we believe that we will enhance and strengthen the development by the TVA of the between-the-lakes area.

Mr. Chairman, I have a map here—just to give you a rough idea of the area we are talking about. I will just leave it with you. Here is the wild life refuge area, and here is the proposed canal, and here are the points within which we are talking.

Senator HILL. I see.

ARGUMENTS FOR RETAINING PRIVATE OWNERSHIP OF PROPERTIES IN BETWEEN-THE-LAKES AREA

Mr. AVEDISIAN. Now, Mr. Chairman, our arguments as to why we want to retain private ownership of properties in the area known as Between-the-Lakes, are as follows:

(1) That, we are not against the development of the national recreation area by TVA consisting of approximately 170,000 acres of land for the public use, according to their press releases.

OPPOSITION TO CONDEMNATION OF APPROXIMATELY 4,000 ACRES

(2) However, we are against allowing TVA to condemn and acquire additional lands (consisting of approximately 4,000 acres) generally located from the proposed canal connecting Kentucky Lake with Barkley Lake, running southward along both sides of Kentucky Highway 453 to DePriest's grocery store, at which point Kentucky Highway 522 intersects. This small area also includes villages, one being Twin Lakes. In other words, we want TVA to be restricted by the appropriations act to draw their line of condemnation no further north than Kentucky Highway 522, at which point DePriest's grocery store is located, thus allowing private ownership north of this point to the proposed canal on both sides of Kentucky Highway 453 to retain their properties, all of which border the eastern shoreline of Kentucky Lake and the western shoreline of Barkley Lake.

(3) That already the eastern shoreline from the dam, near Grand Rivers, Ky., is far along in development as far as the Little River embayment, however, the western shoreline of Barkley Lake, in the

Between-the-Lakes area in question, the lake shore acreage is limited because of Federal ownership, that is, the national wildlife refuge which TVA has acquired. Nevertheless, the lake has exerted a tremendous attraction to all parts of the country.

Lyon County tax records now indicate that purchases of these lake shore lots in the Between-the-Lakes area are from 35 States, including Alaska, with building sites having been purchased within the past 15 years.

ONLY REMAINING AREA FOR BUILDING SITES

(4) That this area in question is the only remaining area within commuting distance from Paducah and McCracken County for building sites of summer and year-around homes, with a fast growing community in western Kentucky.

(5) That, the majority, if not all, of the shoreline of Kentucky Lake is now either owned by TVA or other private ownership. Because of this, there is absolutely no other acreage to which we may remove ourselves should TVA be allowed to condemn what little we now own.

6. That, just 2 years ago, TVA sold all of their lots along the eastern shoreline of Kentucky Lake in the between the lakes area from the proposed canal southward to Kentucky Highway 522 to private owners at a good market price and now TVA desires to recondemn these identical lots. For what motive, I do not know.

MOVING OF RESIDENTS

7. That some area residents have already moved twice due to the condemnation since the impoundment of Kentucky Lake—and will now have to move for the third time, if TVA is allowed to condemn this area in question.

There is an individual that comes to my mind who is 82 years old. She was originally living in the impoundment area of Kentucky Lake and had to move, and move, unfortunately, into the impoundment area of Barkley Lake. Then she moved from there to this general area in question and she is now being threatened for the third time.

8. There is some difference between permitting condemnation of land for impoundment of the reservoir, or, rights-of-way, from land condemned along its fringe area for public recreational purposes, especially when TVA will have some 170,000 acres to satisfy such purposes in the first instance.

THE AREA OF 170,000 ACRES IS ADEQUATE

9. That, we feel approximately 170,000 acres is adequate and sufficient land for such purpose and whether or not TVA gets our additional 4,000 acres, more or less, certainly will not jeopardize their overall project.

We cannot understand the justification for the additional expenditure of several millions of dollars of taxpayers' money to acquire our area in question when its ratio to the overall tract is so small.

COMPETITION WITH PRIVATE ENTERPRISE

10. That, we feel TVA is a self-propelled financial agency, selling power, of course, and is now competing with private enterprise and private ownership in real estate.

From the statement of Mr. Wagner today, I believe he is a Chairman of the TVA Board—he did state in the Pickwick area reservoir—and I think I am quoting him correctly—that TVA has undertaken a study of some sort in the rise of land values along waterfronts. From 1947 to 1960 the purchase price has increased some six times. For example, I believe he gave a purchase price of \$20 an acre that they purchased and now are selling it for \$120 an acre. In isolated examples they are selling it for much more. I believe another example he gave was \$100 an acre purchase price, and then they turned around and sold it for several thousand dollars an acre.

I believe he further stated that enhancement in value has attracted the public and, therefore, TVA tries to recapture the enhancement of the value in order to pay for the development costs. And the basic principle he states is sound and more and more important, ways to recapture are under study continually, he stated.

I would respectfully request the clerk of this subcommittee to give me a copy of this testimony—I would like to have it.

Senator HILL. You would like to have a copy of the hearing?

Mr. AVEDISIAN. Yes, a copy of the hearings of the subcommittee; yes, Mr. Chairman.

PROFITEERING NOT INTENDED

The next, point 11. That no profiteering is intended by any private owner except the right to enjoy his property rights just like any other property owner, and, if, as, and when he decides to sell any excess acreage or lots that he be afforded the same opportunity as any other private owner in downtown Washington.

LOSS OF TAX REVENUE

12. That, if TVA is allowed to condemn the area in question, there will be a great loss of tax revenue because of the fact that TVA will not make "in lieu of tax payments" on nonproductive or non-income-producing properties which they hold. Certainly, all of the 170,000 acres will, I believe, be deemed non-income-producing property; that is, the national recreation area between the lakes.

Whereas our area in question, if left to private ownership, will be taxable, or income production property. Revenue in all forms will be completely curtailed in the city of Grand Rivers, Ky., and other surrounding communities without private ownership.

13. That, TVA states, according to their press releases the national recreation area will draw 10 million tourists the year around, thus bringing in year-round revenue to the communities. It may be true that 10 million tourists will be attracted to the area, however, we seriously doubt whether it will be a year-round operation due to weather conditions and other factors. At best, they may have an 8-month operation, thus leaving 4 months out of each year completely dormant without private ownership in the area.

ACCEPTANCE OF APPRAISAL OFFER

14. That, majority of the property owners in the area (conservative 90 percent) voluntarily agreed with U.S. Corps of Engineers to accept their appraisal offer (an average of \$100 acre) without resorting to a court of law on price, purely and solely on the grounds that the Corps

of Engineers convinced the property owners they would improve the area to the extent that the residue of acreage left such owners would appreciate in value, thus compensating them indirectly for their loss on the present sales.

In other words, in reliance upon these statements of the Corps of Engineers, the majority of owners did not take their case to the courts.

TVA WANTS RESIDUE

Now, TVA comes along and wants the residue. And this afternoon for the first time I found out I guess the reason why. They want to recapture the enhanced value in order to pay for the project. We feel that placing a property owner in this position, whether intentionally or unintentionally, is an unfair and unjust result.

15. That the Four Rivers Council of Boy Scouts and Girl Scouts, under somewhat the same situation, agreed to pay a reasonable rental on a lease arrangement with TVA. After making major improvements and upon termination of the lease period, TVA gave the council first priority of a forced purchase before selling their property to any outsider for a high bid.

Being placed in this unfortunate predicament, the council went all out for contributions—raised the money and paid TVA off.

OPPOSITION TO CONDEMNATION OF CHURCH PROPERTY

16. That, the chairman of the Committee on Camps and Conference Centers of the U.S.A. Presbytery and U.S. Presbytery, Mr. William P. Donan; the executive secretaries of both churches, Rev. George T. Hubbard and Rev. Hermon R. Schuessler, respectively, all of whom represent some 8,000 church conference members, are unequivocally against TVA being authorized to condemn and acquire their church property located in the area in question, approximately 1 mile south of the proposed canal, for the simple reason that they are not utilizing this site for the public use and benefit, identical in every way (if not more so) than the use to which TVA is proposing.

This conference center is used not only by 8,000 members, but is also used for retarded children. Other denominations also use this center; namely, the Christian Church for one, and others, because of their crowded schedules and facilities necessitate their calling upon the Presbyterian center.

Furthermore, it will be virtually impossible to replace the church conference center facilities elsewhere, if TVA is permitted to acquire this property.

Moreover, both churches now have a tremendous investment in their property; that this center is situated in a very favorable geographical location of water and woods in serving both presbyteries; that it has taken them 5 years to locate and purchase this property; that the church center is not only recreational but also is an educational center for the clergy and its 8,000 members, that it is a definite arm of the church.

TVA OFFER TO LEASE BACK THE CENTER

That TVA has unofficially and indirectly offered to lease back the center after condemnation, however, there are no guarantees what-

soever to this proposition and they cannot jeopardize their position on uncertainties.

What assurance does the presbytery have that TVA will not treat the church just like they treated the Boy Scout and Girl Scout Council at the expiration of a so-called lease agreement?

Furthermore, any sort of plan entered into by the church with TVA, other than a fee ownership of their property, would hamper and curtail any possible further expansion of the facilities at the center because of being constantly apprehensive of a forced sale by TVA at the end of the term of such a plan, and for an unknown selling price.

MOST EXPENSIVE AREA

17. That the area in question (between the lakes, from the proposed canal running southward on both sides of Kentucky Highway 453 to Kentucky Highway 522 at Depriest's grocery store), is the most expensive area, which includes private homes, businesses, several villages, some 100 completed subdivisions with restrictions preserving and enhancing the value of the land and lots sold.

Typical restrictions being—

- (a) no subdividing lots other than as plotted;
- (b) a minimum expenditure for a house from \$8,000 to \$10,000;
- (c) preservation of trees;
- (d) construction limited to brick, stone, and conventional wood materials;
- (e) no outdoor toilet facilities; and
- (f) type of fuel specified with coal prohibited in some subdivisions.

18. That the Secretary of Interior, Mr. Udall met with the chairman and committee members of the Committee on Development of the area in between the Lakes some 3 years ago and verbally promised this committee that the area in question would not be condemned and acquired by the Government; that it would remain in the hands of private ownership.

STUDY OF CAPE COD APPROPRIATIONS ACT

19. Lastly, gentlemen, we have made a preliminary study of the Cape Cod Appropriations Act having somewhat the same problems as we have in western Kentucky, which act was amended several times by the congressional committee in order to allow private owners to retain their properties in the Cape Cod area. The act in its original form spelled out a complete taking of the lands by the Government. However, later amendments produced an equitable result to both the Government and the area residents, on a compromise or give-and-take basis.

Thank you very much for giving me the opportunity of presenting these views of my clients before this honorable committee.

Senator HILL. Let me ask you something, sir. Have you talked with any representative of TVA about this matter.

DISCUSSION WITH MR. JONES

Mr. AVEDISIAN. I have talked to Mr. Jones, who is vice chairman for about 10 minutes in the lobby of the Irving Cobb Hotel on his

way out of town from a Rotary Club meeting, I believe it was. I asked him if he knew what TVA was going to do in this general area, because of the fact that the area residents are very apprehensive about what is going to happen. His remark was that he did not know a thing about what they were going to do until they got the appropriation. Of course, naturally once he gets the appropriation act and his money then he will have a knowledge of just how far he wants to go and, of course, how flexible he can be. That is about all I got out of him. And that's it.

Senator HILL. Don't you think it might be well to have a real conference with some representative of TVA on this matter?

REQUEST FOR LIMITATION IN ACT

Mr. AVEDISIAN. Well, we would like for this to be a limitation in the act itself, Mr. Chairman, because if it is not, then talking to them after that is pretty much a one-sided affair.

They will have the authority which is given to them in the act based upon title 10. There will be no issue of public use because Congress will have already acted on it, you see. And the only issue remaining is damages—how much are you entitled to and why you are not satisfied. So I believe that this is the proper time for us to present our views, and with this in mind, that is the reason I am here.

Senator HILL. How long has it been since you talked with Mr. Jones in Paducah?

Mr. AVEDISIAN. I believe it has been about a month.

Senator HILL. Congressman Stubblefield?

Mr. STUBBLEFIELD. The question I was going to ask was also about talking to TVA.

Senator HILL. I am sure, as a lawyer, you know that many times you sit down together and you come to agreements.

Mr. AVEDISIAN. We would welcome that very much. But we would like to definitely press for the limitation in the act itself, first, and then we would be delighted to talk to them.

Mr. STUBBLEFIELD. If you had an agreement—

Mr. AVEDISIAN. If we had an agreement, that would be better.

Senator HILL. If you had an agreement, that would be best. That would certainly be best, it seems to me.

I would welcome any suggestions from the committee or anybody else.

SENATOR HILL'S SUGGESTION

Senator HILL. Well, frankly, my suggestion would be to sit down—and I would suggest you go to the headquarters in Knoxville because there they have all the maps, they are here and I am sure they could talk to you here, but I think it would be best if you went right to the headquarters where they have all the maps and all the data.

Mr. AVEDISIAN. Yes. But Mr. Chairman, I can go down there and have a conversation with them—but they, themselves, won't know what they can do until they get this act in their pocket. And it would be a matter of conjecture, I believe. They could not bind themselves to anything until they got the act. It would be pure and simple talk—if I may say that, for whatever it would be worth.

Senator HILL. No; I don't think it would be pure and simple talk. This is just a question of their getting the money. If they had any

kind of understanding or agreement with you now, I am sure they would give consideration to it.

Mr. AVEDISIAN. I will welcome any type of conference or compromise. We are open to any suggestions.

QUESTION RE CHARACTER OF OWNERSHIP OF LAND

Senator HILL. Senator Cooper?

Senator COOPER. The 4,000 acres of land which are owned by your clients—I understand there are 4,000 acres owned by your clients.

Mr. AVEDISIAN. They are not all my clients. It is 4,000 in this area.

Senator COOPER. Does that represent all the privately owned land in the 170,000 acres to be embraced in this area?

Mr. AVEDISIAN. I am not certain of that, Senator. I do not have the true acreage figures.

Senator COOPER. What is the character of the ownership within this 4,000 acres? Is it farmland, or is any of it developed land, in the sense of being a residential area?

DEVELOPED LAND

Mr. AVEDISIAN. Of course, there are some villages in there, such as Twin Lakes and there are some hundred subdivisions and some of them quite built up and completed.

Senator COOPER. Do you know how many people live in this 4,000-acre area?

Mr. AVEDISIAN. I do not know exactly the number of the population in that area.

Senator COOPER. Any improved road run through it?

Mr. AVEDISIAN. Yes, sir; 453 goes through it, which is improved. And in the subdivisions they have a tremendous amount of improvement in roads.

Senator COOPER. A Waterway? Is it on either one of these rivers?

Mr. AVEDISIAN. Yes, sir; it is right in between the lakes.

Senator COOPER. Is there any tributary of the river?

Mr. AVEDISIAN. No, I don't believe there is, no tributaries in there.

Senator COOPER. As I understand your argument, this is an area of 4,000 acres of which at least a part of it has been developed by subdivisions, by residential property, and if these people do not want to give up their land, they do not think it is needed for the purposes of this recreational area between the rivers.

Mr. AVEDISIAN. That's right, Senator. They want to retain their property and live there for the rest of their lives. They are certainly not there to hamper the TVA project in any way, shape, or form.

IMPROVEMENT OF REMAINING 170,000 ACRES NOT AFFECTED

Senator COOPER. If it was left out, would it interfere with the improvement of the remainder of the 170,000 acres?

Mr. AVEDISIAN. Absolutely not. We do not think it would, Senator. It would not add to it one iota. The only thing it would do, looking at that map in general, it would give TVA a waterline all the way around your property, which would make it, I guess, desirable from

their standpoint. But for what purpose, I don't know—except that you would have a waterline on your boundary—except for the Highway 522. That is about my analysis of the thing. You have water all the way around your property, except the highway.

Mr. STUBBLEFIELD. About how many people live in that area? Permanent residents?

Mr. AVEDISIAN. I don't know that figure, Congressman Stubblefield, but I can get it for you.

SUGGESTED CONFERENCE WITH MR. WAGNER

Senator HILL. I am going to make this suggestion to you, if I may—that you get in touch with Mr. Wagner, who is the Chairman of the Board, and ask for an engagement to come down and talk to him. Go down and have a conference with him. I am sure he will be glad to see you and you would have a good reception—go down and talk the matter over with him.

Mr. AVEDISIAN. I will be glad to go down, Mr. Chairman, if I thought it was going to further our case—I would be willing to do anything to further it.

Senator HILL. I am sure that is the thing to do. Are you going back to Kentucky tonight?

Mr. AVEDISIAN. Yes, sir.

Senator HILL. I would not delay in either wiring or writing Mr. Wagner, Chairman of the Board, TVA headquarters, Knoxville, Tenn., and I am sure he will be glad to see you.

Mr. AVEDISIAN. All right, sir, I will certainly do that.

Senator HILL. All right—good.
Anything else?

COMMITTEE RECESS

The committee will stand in recess.

(Whereupon at 4:25 p.m. Tuesday, November 19, 1963, the subcommittee stood in recess subject to the call of the Chair.)

The first part of the book is devoted to a general history of the United States from its discovery to the present time. It is written in a clear and concise style, and is well adapted for use in schools and colleges. The author has done his best to give a full and accurate account of the events which have shaped our country, and to show the progress of our civilization. The book is a valuable work, and one which every citizen should read.

The second part of the book is devoted to a detailed history of the United States from the discovery of the continent to the present time. It is written in a clear and concise style, and is well adapted for use in schools and colleges. The author has done his best to give a full and accurate account of the events which have shaped our country, and to show the progress of our civilization. The book is a valuable work, and one which every citizen should read.

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