Union Calendar No. 365

103D CONGRESS
2D SESSION

H.R. 4908

[Report No. 103–674]

A BILL

To authorize the hydrogen and fusion research, development, and demonstration programs, and the high energy physics and nuclear physics programs, of the Department of Energy, and for other purposes.

AUGUST 5, 1994

Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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IN THE HOUSE OF REPRESENTATIVES

AUGUST 5, 1994

Mrs. Lloyd (for herself, Mr. BOUCHER, Mr. BROWN of California, Mr. WALKER, and Mr. BOEHLERT) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

AUGUST 5, 1994

Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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A BILL

To authorize the hydrogen and fusion research, development, and demonstration programs, and the high energy physics and nuclear physics programs, of the Department of Energy, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Hydrogen, Fusion, and High Energy and Nuclear Physics Research Act of 1994''.

SEC. 2. GENERAL FINDINGS.

The Congress finds that—

(1) by the year 2050, the world will need to supply between 2 and 3 times as much energy as is presently produced to meet minimum requirements for food, shelter, transportation, and economic security;

(2) meeting the increased energy demands of the year 2050 cannot be achieved without substantial environmental degradation unless there is a massive shift from dependence on fossil fuels which today provide more than three-quarters of all energy supply;

(3) a wide variety of nonfossil fuel energy technologies must be developed to meet the expected demand of the year 2050;

(4) the Federal Government has a responsibility to fund research in energy technologies to help meet future expected energy demand where the technical or economic risks of development are too high, or the development time is too long, to be borne solely by the private sector, or where the benefits accrue

to all and cannot be recouped by a private investor; and

(5) despite the urgent need to develop a wide variety of nonfossil energy technologies, the Federal Government's investment in all energy supply research and development (including fossil fuels) has declined in real terms by more than two-thirds in the last 14 years.

SEC. 3. DEFINITIONS.

For purposes of this Act—

(1) the term ''alternative fusion concepts'' means any concepts for the production of energy based on the fusing of atomic nuclei other than toroidal magnetic fusion concepts, including heavy ion inertial fusion, aneutronic fusion, and electrostatic fusion;

(2) the term ''demonstration'' means a demonstration to determine technological and economic feasibility;

(3) the term ''Department'' means the Department of Energy;

(4) the term ''Fusion Energy Research Program'' means the program described in section 203;

(5) the term ''host country'' means the country selected by the international partners as the site for the ITER facility;

(6) the term ''international partners'' means the United States, the European Atomic Energy Community, Japan, and the Russian Federation;

(7) the term ''ITER'' means the International Thermonuclear Experimental Reactor;

(8) the term ''magnetic fusion'' means fusion based on toroidal confinement concepts;

(9) the term ''Secretary'' means the Secretary of Energy; and

(10) the term ''Tokamak Physics Experiment'' means a facility to replace the Tokamak Fusion Test Reactor which is designed to be capable of conducting experiments on reactions with a pulse length of at least 15 minutes and demonstrating a more compact and efficient magnetic fusion reactor design.

TITLE I—HYDROGEN ENERGY RESEARCH PROGRAM

SEC. 101. SHORT TITLE.

This title may be cited as the ''Hydrogen Future Act of 1994''.

SEC. 102. FINDINGS.

The Congress finds that—

(1) fossil fuels, the main energy source of the present, have provided this country with tremendous supply but are limited and polluting, and their production and utilization technologies are mature;

(2) the basic scientific fundamentals are needed for private sector investment and development of new and better energy sources and enabling technologies;

(3) hydrogen holds tremendous promise as a new and better energy source because it secures a practically infinite supply from water and combusts purely to water;

(4) hydrogen production efficiency is a major technical barrier to society collectively benefitting from one of the great energy sources of the future;

(5) an aggressive, results-oriented, multiyear research initiative on efficient hydrogen fuel production and use should continue; and

(6) the current Federal effort to develop hydrogen as a fuel is inadequate.

SEC. 103. PURPOSES.

The purposes of this title are—

(1) to provide for the development and demonstration of the processes and technologies needed to produce, store, transport, and utilize hydrogen for

transportation, industrial, residential, and utility applications; and

(2) to foster industry participation during each stage of the Department of Energy hydrogen research, development, and demonstration program to ensure that technology transfer to the private sector occurs to develop viable, marketable products.

SEC. 104. RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) PROGRAM GOAL.—The goal of the program described in this section is the demonstration, by the year 2000, of the practicability of utilizing hydrogen for transportation, industrial, residential and utility applications on a broad scale.

(b) PRODUCTION.—The Secretary shall support hydrogen energy production research, development, and demonstration in the following areas, including funding for at least 1 technical demonstration in each such area:

(1) Photoconversion.

(2) Bioconversion.

(3) Electrolysis of water.

(c) STORAGE.—The Secretary shall support research, development, and demonstration of safe and economical storage of hydrogen, both for onboard vehicle and stationary use. Such research, development, and demonstration

should be aimed at improving existing methods and developing new approaches in each of the following areas, including funding for at least 1 technical demonstration in each such area:

(1) Hydrides and porous materials.

(2) Liquefaction and cryogenics.

(3) Compressed gas, especially low-temperature dense gas.

(4) Advanced methods, such as iron oxide, microspheres, and phase change materials.

(d) USE.—The Secretary shall support hydrogen energy research, development, and demonstration for each of the following uses, including funding for at least 1 technical demonstration in each such area:

(1) Fuel cell systems for stationary applications.

(2) Fuel cell systems for mobile applications.

(3) Electricity generation using hydrogen as a fuel source for utility and industrial applications.

(4) Heating and cooling using hydrogen.

(e) TRANSPORTATION.—The Secretary shall support research, development, and demonstration of safe, efficient, and nonpolluting hydrogen-based transportation vehicles of the following types, including funding for at least 1 technical demonstration of each such type:

(1) An economically feasible, low emission motor vehicle using hydrogen as a combustible power supply, either in pure form or mixed with other fuels, in a hybrid electric vehicle using a hydrogen fuel cell.

(2) An economically feasible, zero emission or low emission engine using hydrogen.

(f) SCHEDULE.—Within 180 days after the date of enactment of this Act, the Secretary shall solicit proposals for carrying out the research and development activities authorized under this section. Awards of financial assistance shall be made within 1 year after such date of enactment.

(g) COST SHARING.—(1) Except as otherwise provided in section 105, for research and development programs carried out under this title, the Secretary shall require a commitment from non-Federal sources of at least 20 percent of the cost of the project. The Secretary may reduce or eliminate the non-Federal requirement under this paragraph if the Secretary determines that the research and development is of a basic or fundamental nature.

(2) The Secretary shall require at least 50 percent of the costs directly and specifically related to any demonstration project under this title to be provided from non-

Federal sources. The Secretary may reduce the non-Federal requirement under this paragraph if the Secretary determines that the reduction is necessary and appropriate considering the technological risks involved in the project and is necessary to serve the purposes and goals of this title.

(3) In calculating the amount of the non-Federal commitment under paragraph (1) or (2), the Secretary shall include cash, personnel, services, equipment, and other resources.

(h) DUPLICATION OF PROGRAMS.—Nothing in this title shall require the duplication of activities carried out under otherwise authorized programs of the Department of Energy.

SEC. 105. HIGHLY INNOVATIVE TECHNOLOGIES.

Of the amounts made available for carrying out section 104, up to 5 percent may be used to support research on highly innovative energy technologies. Such amounts shall not be subject to the cost sharing requirements in section 104(g).

SEC. 106. TECHNOLOGY TRANSFER.

The Secretary shall foster the exchange of generic, nonproprietary information and technology developed pursuant to section 104, or other similiar Federal programs,

among industry, academia, and the Federal Government with regard to production and use of hydrogen.

SEC. 107. REPORTS TO CONGRESS.

Within 18 months after the date of enactment of this Act, and annually thereafter, the Secretary shall transmit to the Congress a detailed report on the status and progress of the Department of Energy's hydrogen research, development, and demonstration programs. Such report shall include an analysis of the effectiveness of such programs, to be prepared and submitted by the Hydrogen Technical Advisory Panel established under section 108 of the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990. Such Panel shall also make recommendations for improvements to such programs if needed, including recommendations for additional legislation.

SEC. 108. COORDINATION AND CONSULTATION.

(a) COORDINATION WITH OTHER FEDERAL AGENCIES.—The Secretary shall coordinate all hydrogen research, development, and demonstration activities with other Federal agencies involved in similar research, development, and demonstration, including the Department of Defense and the National Aeronautics and Space Administration.

(b) CONSULTATION.—The Secretary shall consult with the Hydrogen Technical Advisory Panel established under section 108 of the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 as necessary in carrying out this title.

SEC. 109. REPEAL.

Sections 104 and 105 of the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 are repealed.

SEC. 110. AUTHORIZATION OF APPROPRIATIONS.

(a) GENERAL AUTHORIZATION.—There are authorized to be appropriated, to carry out the purposes of this title, in addition to any amounts made available for such purposes under other Acts—

(1) $12,000,000 for fiscal year 1995;

(2) $20,000,000 for fiscal year 1996;

(3) $40,000,000 for fiscal year 1997; and

(4) $60,000,000 for fiscal year 1998.

(b) RELATED AUTHORIZATIONS.—For each fiscal year from 1995 through 1998, the total amount authorized to be appropriated for Energy Supply Research and Development Activities shall not exceed $3,302,170,000.

TITLE II—FUSION ENERGY RESEARCH PROGRAM

SEC. 201. FINDINGS.

The Congress finds that—

(1) fusion energy is one of the nonfossil fuel technologies which could potentially provide safe, abundant, environmentally sound, secure, and affordable energy supplies in the future;

(2) in the last 16 years, fusion energy researchers have made significant progress toward realizing magnetic fusion as a viable source of energy, increasing power production from test reactors more than a million-fold over that time period;

(3) while significant engineering, technical, and scientific challenges remain to make fusion energy commercially viable, limited funding remains the primary constraint to more rapid progress;

(4) the technical risks and the long time scale needed to demonstrate the commercial viability of fusion energy will likely require a stable, predictable, and sustained investment of government funding for decades to come;

(5) while magnetic fusion is the leading fusion technology, research on alternative fusion concepts should continue to be supported;

(6) opportunities to participate in international fusion experiments can dramatically lower the cost to the Federal Government of fusion energy research;

(7) the United States must demonstrate that it is a credible partner in international scientific programs by being able to make and keep long-term commitments to funding and participation; and

(8) the United States should commit to participating in the siting, construction, and operation of ITER as soon as practicable.

SEC. 202. PURPOSES.

The purposes of this title are—

(1) to provide direction and authorize appropriations for a broadly based fusion energy research, development, and demonstration program;

(2) to ensure that alternative fusion concepts receive adequate funding and management attention from the Department of Energy;

(3) to provide an accelerated commitment to United States participation in ITER and provide authorization of appropriations for such activity contingent on meeting program milestones; and

(4) to provide for the selection of a host country and establish a site selection process for ITER.

SEC. 203. FUSION ENERGY RESEARCH PROGRAM.

(a) FUSION PROGRAM.—The Secretary shall carry out in accordance with the provisions of this title a Fusion Energy Research Program, including research, development, and demonstration to demonstrate the technical and economic feasibility of producing safe, environmentally sound, and affordable energy from fusion.

(b) PROGRAM GOALS.—The goals of the Fusion Energy Research Program are to demonstrate by the year 2010 the practicability of commercial electric power production and to lead to commercial production of fusion energy by the year 2040.

(c) PROGRAM ELEMENTS.—The Fusion Energy Research Program shall consist of the following elements:

(1) Research, development, and demonstration on magnetic fusion energy technology, including—

(A) research on plasma physics and control, confinement, ignition, and burning;

(B) the design, construction, and operation of experimental fusion reactors, including the Tokamak Physics Experiment, and the development of special materials for such reactors, the facilities to develop such materials, and the development of components which support the operation of such reactors, such as diagnostic and remote maintenance equipment; and

(C) participation by the United States industrial sector in the design and construction of fusion reactors, and cooperation with utilities.

(2) Research, development, and demonstration of alternative fusion concepts, to be administered through a Program Director for Alternative Fusion Research, including research and development needed to build and test an Induction Linac Systems Experiment, and for systems engineering and design of a prototype inertial fusion energy power plant suitable for the eventual development of a heavy ion based commercial power plant, for the purpose of developing heavy ion inertial fusion energy.

(3) Participation in the design, construction, and operation of ITER with the goal of ITER becoming operational by the year 2005.

SEC. 204. INDEPENDENT REVIEW OF FUSION TECHNOLOGIES.

Within 6 months after the date of enactment of this Act, the Secretary shall contract with the National Academy of Sciences to conduct a study, to be completed within 18 months after such contract is executed, which—

(1) examines the various magnetic fusion technologies and alternative fusion concepts to assess their current state of development;

(2) evaluates the potential of such technologies and concepts to become commercially viable sources of energy in the future;

(3) identifies research and development goals and priorities, and the range of probable costs and time scales needed to achieve commercial viability; and

(4) reviews facilities formerly proposed by the Department of Energy for construction during the past 10 years, comparing their proposed capabilities and the justification offered for such proposals with the rationale for the subsequent withdrawal of the proposals.

SEC. 205. NATIONAL ACADEMY OF SCIENCES STUDY.

Within 6 months after the date of enactment of this Act, the Secretary shall contract with the National Academy of Sciences to conduct a study, to be completed within 18 months after such contract is executed, which examines the status and promise of other energy sources, including deuterated metal, and improvements in the efficient use of energy which could affect our national energy needs on the same time scale and quantity as projected fusion energy development, and which identifies priorities for research on other energy sources and energy-efficient devices and practices.

SEC. 206. ITER SITE SELECTION PROCESS.

(a) ITER STUDY AND REPORT.—Within 120 days after the date of enactment of this Act, the Secretary shall submit to Congress a study which compares the technical and scientific advantages and disadvantages and the economic costs and benefits to the United States of siting ITER in the United States with siting ITER outside of the United States. Such study shall include the consideration of the impact on employment of constructing ITER in the United States, the effect of manufacturing major ITER subsystems (such as superconducting magnets) in the United States, and the effect of siting on United States funding requirements for participation in ITER.

(b) HOST-COUNTRY SELECTION.—The Secretary shall seek to reach an agreement with the international partners which provides for—

(1) the selection of a host country in which to site ITER by October, 1995;

(2) the equitable distribution of economic and technological benefits among the international partners, including the siting and construction of ITER and related facilities and the manufacture of major ITER subsystems;

(3) substantial United States industry and utility involvement in the design, construction, and operation of ITER to ensure United States industry

and utility expertise in the technologies developed; and

(4) a schedule to complete site-specific design activities by 1998.

(c) UNITED STATES SITE SELECTION.—The Secretary shall—

(1) immediately initiate a process for identifying candidate sites within the United States which meet the site requirements for the construction and operation of ITER; and

(2) propose within 90 days after the date of enactment of this Act a process for selection of a site within the United States by June, 1996, if the United States is selected as the host country for ITER pursuant to the international agreement described in subsection (b).

(d) FINAL COST ESTIMATE.—The Secretary shall provide to Congress, within 90 days following the completion of site-specific design activities, a detailed estimate of the final projected total cost and cost to the United States of the construction and operation of ITER based on final site-specific engineering and construction designs.

SEC. 207. REPORTS AND MISCELLANEOUS PROVISIONS.

(a) CONTINGENCY PLAN.—Within 120 days after the date of enactment of this Act, the Secretary shall submit

to Congress a report on the feasibility of conducting a parallel design effort on the Tokamak Physics Experiment to augment the capabilities of or accelerate construction of the Tokamak Physics Experiment in the event that an international agreement cannot be reached on the site selection or construction of ITER.

(b) PROGRAM REPORT.—Within 180 days after the date of enactment of this Act, and biennially thereafter, the Secretary shall prepare and submit to the Congress a report on the Fusion Energy Research Program and the progress it has made in meeting the goals and requirements of this title.

(c) CONSULTATION.—(1) In consultation with the Secretary of Defense, the Secretary shall review the research and development activities of the defense Inertial Confinement Fusion Program to determine the potential of such activities to contribute to the civilian Inertial Fusion Energy Program.

(2) Within 120 days after the date of enactment of this Act, the Secretary, in consultation with the Secretary of Defense, shall submit a report to Congress with recommendations for sharing budget and other resources in order to enhance the civilian energy applications of the defense Inertial Confinement Fusion Program.

(d) DUPLICATION OF ACTIVITIES.—Nothing in this title shall require the duplication of activities carried out under otherwise authorized programs of the Department of Energy.

SEC. 208. AUTHORIZATION OF APPROPRIATIONS.

(a) FUSION ENERGY RESEARCH PROGRAM.—There are authorized to be appropriated to the Secretary for carrying out the Fusion Energy Research Program $376,563,000 for fiscal 1995, $425,000,000 for fiscal year 1996, and $475,000,000 for fiscal year 1997.

(b) ALTERNATIVE FUSION RESEARCH.—From the sums authorized in subsection (a), there are authorized to be appropriated to the Secretary for carrying out the Alternative Fusion Research Program under section 203(c)(2)—

(1) $10,000,000 for fiscal year 1995 for the Induction Linac Systems Experiment project and related base programs, and for the engineering and design of a prototype inertial fusion energy power plant;

(2) $30,000,000 for fiscal year 1996, of which—

(A) not more than $20,000,000 shall be for the Induction Linac Systems Experiment project and related base programs; and

(B) not more than $5,000,000 shall be for the engineering and design of a prototype inertial fusion energy power plant; and

(3) $33,000,000 for fiscal year 1997, of which—

(A) not more than $20,000,000 shall be for the Induction Linac Systems Experiment project and related base programs; and

(B) not more than $5,000,000 shall be for the engineering and design of a prototype inertial fusion energy power plant.

(c) TOKAMAK PHYSICS EXPERIMENT.—(1) Except as provided in paragraph (2), there are authorized to be appropriated to the Secretary for the period encompassing fiscal years 1995 through 2000 not to exceed $700,000,000, to complete the design, development, and construction of the Tokamak Physics Experiment.

(2) None of the funds are authorized to be appropriated for any fiscal year under paragraph (1) unless, within 60 days after the submission of the President's budget request for that fiscal year, the Secretary—

(A) certifies to the Congress that—

(i) the technical goals of the design, development, and construction are being met;

(ii) the design, development, and construction can be completed without further authorization of appropriations beyond amounts authorized under paragraph (1); and

(iii) the design, development, and construction can be completed by the end of fiscal year 2000; or

(B) submits to the Congress a report which describes—

(i) the circumstances which prevent a certification under subparagraph (A);

(ii) remedial actions undertaken or to be undertaken with respect to such circumstances; and

(iii) a justification for proceeding with the program, if appropriate.

(d) CONSTRUCTION OF ITER.—No funds are authorized for the construction of ITER.

(e) LIMITATION ON MAGNETIC FUSION FACILITIES.—No funds are authorized for the design, engineering, or construction of any magnetic fusion facility other than ITER, facilities related to ITER, and the Tokamak Physics Experiment.

SEC. 209. REPEAL OF ADVISORY COMMITTEE.

Section 7 of the Magnetic Fusion Energy Engineering Act of 1980 (42 U.S.C. 9306), authorizing the Technical Panel on Magnetic Fusion, is repealed.

TITLE III—HIGH ENERGY AND NUCLEAR PHYSICS

SEC. 301. SHORT TITLE.

This title may be cited as the ''Department of Energy High Energy and Nuclear Physics Authorization Act of 1994''.

SEC. 302. DEFINITIONS.

For the purposes of this title—

(1) the term ''CERN'' means the European Organization for Nuclear Research;

(2) the term ''construction'' means all activities necessary for completion of a project and its supporting infrastructure, and includes conventional construction and the fabrication, installation, testing, and preoperation of technical sytems;

(3) the term ''conventional construction'' means the design and construction of civil works, facilities, and other infrastructure necessary to construct a project, including tunnels, buildings, and roads, necessary to house and support the technical systems, and utilities as necessary for the direct support of elements of a project; and

(4) the term ''Large Hadron Collider project'' means the Large Hadron Collider project at CERN.

SEC. 303. AUTHORIZATION OF APPROPRIATIONS.

(a) HIGH ENERGY PHYSICS.—There are authorized to be appropriated to the Secretary for high energy physics activities of the Department—

(1) $695,400,000 for fiscal year 1996;

(2) $719,700,000 for fiscal year 1997;

(3) $744,900,000 for fiscal year 1998; and

(4) $713,600,000 for fiscal year 1999.

Funds authorized under paragraphs (1) through (4) may be expended for the B-factory at the Stanford Linear Accelerator Center and the Fermilab Main Injector. Funds may also be expended for research, development, and planning for the Large Hadron Collider and its associated detectors. No funds are authorized for United States participation in the construction and operation of the Large Hadron Collider project until the Secretary certifies to the Congress that there is an international agreement that includes the provisions described in section 304(a).

(b) NUCLEAR PHYSICS.—There are authorized to be appropriated to the Secretary for nuclear physics activities of the Department—

(1) $337,100,000 for fiscal year 1996;

(2) $348,900,000 for fiscal year 1997;

(3) $361,100,000 for fiscal year 1998; and

(4) $373,700,000 for fiscal year 1999.

None of the funds authorized under paragraph (2), (3), or (4) are authorized to be appropriated for facility operations of the Los Alamos Meson Physics Facility. Funds authorized under paragraphs (1) through (4) may be expended for the Relativistic Heavy Ion Collider at Brookhaven National Laboratory.

(c) LIMITATION ON MAJOR CONSTRUCTION PROJECTS.—No funds may be expended for the construction and operation of any high energy and nuclear physics facility construction project of the Department, with total project expenditures projected to be in excess of $100,000,000, unless funds are specifically authorized for such purposes in an Act that is not an appropriations Act. Funds authorized under subsections (a) and (b) may be expended for preliminary research, development, and planning for such projects.

SEC. 304. THE LARGE HADRON COLLIDER PROJECT.

(a) NEGOTIATIONS.—The Secretary, in consultation with the Director of the National Science Foundation and the Secretary of State, shall enter into negotiations with CERN concerning United States participation in the planning and construction of the Large Hadron Collider project, and shall ensure that any agreement incorporates

provisions to protect the United States investment in the project, including provisions for—

(1) fair allocation of costs and benefits among project participants;

(2) a limitation on the amount of United States contribution to project construction and an estimate of the United States contribution to subsequent operating costs;

(3) a cost and schedule control system for the total project;

(4) a preliminary statement of costs and the schedule for all component design, testing, and fabrication, including technical goals and milestones, and a final statement of such costs and schedule within 1 year after the date on which the parties enter into the agreement;

(5) a preliminary statement of costs and the schedule for total project construction and operation, including technical goals and milestones, and a final statement of such costs and schedule within 1 year after the date on which the parties enter into the agreement;

(6) reconsideration of the extent of United States participation if technical or operational milestones described in paragraphs (4) and (5) are not

met, or if the project falls significantly behind schedule;

(7) conditions of access for United States and other scientists to the facility; and

(8) a process for addressing international coordination and cost sharing on high energy physics projects beyond the Large Hadron Collider.

(b) OTHER INTERNATIONAL NEGOTIATIONS.—Nothing in this Act shall be construed to preclude the President from entering into negotiations with respect to international science agreements.

(c) REQUIREMENT.—The Director of the Office of Science and Technology Policy shall report, within 3 months after the date of enactment of this Act, to the Committee on Science, Space, and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate on specific goals for international coordination in megascience projects, including an action plan needed to achieve these goals. The action plan shall address such issues as cost sharing and financial support, site location, access, and management of megascience facilities.

SEC. 305. OPERATING PLAN.

Within 30 days after the date of the enactment of any Act appropriating funds for the high energy or nuclear

physics activities of the Department, the Secretary shall transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a plan for the operations of the high energy and nuclear physics activities of the Department, as adjusted to reflect the amounts appropriated for such purposes by such Act.

SEC. 306. LONG-RANGE PLANNING AND GOVERNANCE.

(a) PROGRAM GOVERNANCE REVIEW.—

(1) REQUIREMENT.—The Secretary shall contract with an appropriate independent organization to review the governance of all elements of the Department's high energy and nuclear physics programs. Such review shall include—

(A) an evaluation of the staff allocation and funding balance among facility operations, construction, and research support; and

(B) an analysis of the extent to which the Department's high energy and nuclear physics advisory groups represent the diversity of, and the full range of interests among, high energy and nuclear physics researchers.

(2) REPORT TO CONGRESS.—The Secretary shall submit a report to Congress within 18 months after the date of enactment of this Act detailing the

results of the review required by this section, including recommendations for implementing the results and schedules for such implementation.

(b) LONG-RANGE PLAN.—

(1) REQUIREMENT.—The Secretary, in consultation with the high energy and nuclear physics communities, shall prepare a long-range plan for the Department of Energy high energy and nuclear physics programs based on current and projected program funding levels. The Secretary shall coordinate the preparation of the plan with the Director of the National Science Foundation, as appropriate, to ensure that long-range planning efforts and objectives for the entire Federal high energy and nuclear physics program are appropriately integrated. The plan shall be modified every 3 years. The long-range plan shall include—

(A) a list of research opportunities to be pursued, including both ongoing and proposed activities, listed in order of priority;

(B) an analysis of the relevance of each research facility to the research opportunities listed under subparagraph (A);

(C) a statement of the optimal balance for the fiscal year in which the report is submitted

among facility operations, construction, and research support and the optimal balance between university and laboratory research programs;

(D) schedules for continuation, consolidation, or termination of each major category of research programs, and continuation, upgrade, transfer, or closure of each research facility;

(E) a statement by project of efforts to coordinate research projects with the international community to maximize the use of limited resources and avoid unproductive duplication of efforts;

(F) a description of the extent to which the plan modifications differ from previous plans submitted under this subsection, along with an explanation for such differences; and

(G) an estimate of—

(i) the number of scientists and graduate students being supported by Federal high energy and nuclear physics programs; and

(ii) the number of scientists and graduate students needed to carry out productive and sustainable research programs in these fields over the next 10 years.

(2) REPORTS TO CONGRESS.—(A) The Secretary shall transmit a copy of the original long-range plan with the President's annual budget request to Congress for fiscal year 1997. The plan as modified shall be submitted with the President's budget request to Congress for every third fiscal year thereafter.

(B) The Secretary shall transmit with the President's budget request to Congress each year a report demonstrating the consistency of the current long-range plan with the budget being requested for the Department's high energy and nuclear physics programs.

(c) CAPITAL BUDGET ACCOUNT.—Each of the President's annual budget requests to the Congress for high energy physics activities of the Department, and for nuclear physics activities of the Department, shall distinguish between the budget for capital expenditures, including all ongoing and planned major construction and capital equipment items, and other activities.

TITLE IV—MISCELLANEOUS PROVISIONS

SEC. 401. UNIVERSITY RADIATION SCIENCE AND TECHNOLOGY.

(a) FINDINGS.—The Congress finds that—

(1) the future of fusion energy and advanced nuclear energy technology research and development programs will rely heavily on a healthy and vibrant university-based radiation science and nuclear engineering academic program;

(2) nuclear engineering is a broad, diverse field with unique academic requirements, including mathematics, physics, reactor engineering, nuclear materials, radiation protection, and reactivity control and operations;

(3) nuclear engineering academic programs at both undergraduate and graduate levels have declined in terms of the number of students enrolling in such programs, the number of schools offering such programs, and the number of research reactors available on university campuses;

(4) the existing nuclear technical community and faculties are aging, and new, younger graduates are not entering the field, threatening the United States technological superiority in this area;

(5) a robust, long-term fusion program will be dependent on the availability of properly trained scientific experts to carry on the program from the current leaders in the field;

(6) in the 1950s and 1960s, the Federal Government was instrumental in founding and funding the University Research Reactor program and the Nuclear Engineering Education and Research program, and as a primary user of the graduates of these programs, continued strong support for these programs for decades;

(7) the decline of Federal support for these programs has forced many universities to close down research reactors and seriously erode the accompanying academic programs;

(8) the current condition of the university research reactors needs attention and funding to upgrade instrumentation and safety features; and

(9) the Federal Government should continue its fuel assistance program in order to avert further hardships to the universities.

(b) PURPOSES.—The purposes of this section are to—

(1) provide Federal support and maintain and upgrade the Nation's Nuclear Engineering Education and Research and University Research Reactor programs, while continuing the University Reactor Fuel Assistance program;

(2) combine these programs into a comprehensive and cohesive national program which will support the future needs of the Nation across many scientific and technological disciplines; and

(3) provide the nuclear engineering education and university research reactor academic community opportunities to consult and cooperate with the Department of Energy and the national laboratories in the decisionmaking and priority setting processes.

(c) PROGRAM DIRECTION.—

(1) COMBINING OF PROGRAMS.—The Secretary shall combine the Nuclear Engineering Research and Education program, the University Research Reactor program, and the University Reactor Fuel Assistance program to form a new University Radiation Science and Technology program to be included as a separate and distinct part of the University and Science Education program.

(2) COLLABORATION.—The Secretary, in developing the annual budget request and program plan for the University Radiation Science and Technology program, shall collaborate with the university radiation science and technology community (including academia, professional societies, and the national laboratories).

(d) REPORTS.—

(1) COMPREHENSIVE PLAN.—The Secretary shall request the Nuclear Engineering Education Department Heads Organization and the National Organization of Test, Research, and Training Reactors to submit, within 60 days after the date of enactment of this Act, to the Congress and the Secretary a minimum of a 5-year comprehensive national plan for the University Radiation Science and Technology program. Such plan shall include comments from industry and all appropriate professional societies.

(2) PROGRAM PROPOSAL.—Within 120 days after the submittal of the plan under paragraph (1), the Secretary shall submit to the Congress a University Radiation Science and Technology program proposal, which shall incorporate the plan submitted under paragraph (1) and shall include comments from the National Academy of Sciences regarding the completeness of the program proposal.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out the University Radiation Science and Technology Program $25,000,000 for fiscal year 1995,

$25,000,000 for fiscal year 1996, and $25,000,000 for fiscal year 1997.

SEC. 402. LIMITATION ON APPROPRIATIONS.

Notwithstanding any other provision of law, no funds are authorized to be appropriated for carrying out the programs for which funds are authorized by this Act for any fiscal year other than as provided by this Act.

HR 4908 RH——2

HR 4908 RH——3