APPENDIX A

LEGISLATION RELATING TO THE ORGANIZATION, FUNCTIONS, AND ACTIVITIES OF THE NATIONAL BUREAU OF STANDARDS/ NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

For most of the legislative acts, only those portions are reproduced that mandated action by NBS/NIST.

July 12, 1894, 28 Stat. 101 (Public Law 105—53d Congress, 2d session)

CHAP. 131.—An Act To define and establish the units of electrical measure.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this Act the legal units of electrical measure in the united States shall be as follows:

First. The unit of resistance shall be what is known as the international ohm, which is substantially equal to one thousand million units of resistance of the centimeter-gram-second system of electro-magnetic units, and is represented by the resistance offered to an unvarying electric current by a column of mercury at the temperature of melting ice fourteen and four thousand five hundred and twenty-one ten-thousandths grams in mass, of a constant cross-sectional area, and of the length of one hundred and six and three-tenths centimeters.

Second. The unit of current shall be what is known as the international ampere, which is one-tenth of the unit of current of the centimeter-gram-second system of electro-magnetic units, and is the practical equivalent of the unvarying current, which, when passed through a solution of nitrate of silver in water in accordance with standard specifications, deposits silver at the rate of one thousand one hundred and eighteen millionths of a gram per second.

Third. The unit of electro-motive force shall be what is known as the international volt, which is the electro-motive force that, steadily applied to a conductor whose resistance is one international ohm, will produce a current of an international ampere, and is practically equivalent to one thousand fourteen hundred and thirty-fourths of the electro-motive force between the poles or electrodes of the voltaic cell known as Clark's cell, at a temperature of fifteen degrees centigrade, and prepared in the manner described in the standard specification.

Fourth. The unit of quantity shall be what is known as the international coulomb, which is the quantity of electricity transferred by a current of one international ampere in one second.

Fifth. The unit of capacity shall be what is known as the international farad, which is the capacity of a condenser charged to a potential of one international volt by one international coulomb of electricity.

Sixth. The unit of work shall be the Joule, which is equal to ten million units of work in the centimeter-gram-second system, and which is practically equivalent to the energy expended in one second by an international ampere in an international ohm.

Seventh. The unit of power shall be the Watt, which is equal to ten million units of power in the centimeter-gram-second system, and which is practically equivalent to the work done at the rate of one Joule per second.

Eighth. The unit of induction shall be the Henry, which is the induction in a circuit when the electromotive force induced in this circuit is one international volt while the inducing current varies at the rate of one Ampere per second.

SEC. 2. That it shall be the duty of the National Academy of Sciences to prescribe and publish, as soon as possible after the passage of this Act, such specifications of details as shall be necessary for the practical application of the definitions of the ampere and volt hereinbefore given, and such specifications shall be the standard specifications herein mentioned.

Approved, July 12, 1894.

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March 3, 1901, 31 Stat. 1449 (Public Law 177—56th Congress, 2d session)

The first organic act for the National Bureau of Standards.

CHAP. 872.—An Act To establish the National Bureau of Standards.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Office of Standard Weights and Measures shall hereafter be known as the National Bureau of Standards.

SEC. 2. That the functions of the bureau shall consist in the custody of the standards; the comparison of the standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government; the construction, when necessary, of standards, their multiples and subdivisions; the testing and calibration of standard measuring apparatus; the solution of problems which arise in connection with standards; the determination of physical constants and the properties of materials, when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

SEC. 3. That the bureau shall exercise its functions for the Government of the United States; for any State or municipal government within the United States; or for any scientific society, educational institution, firm, corporation, or individual within the United States engaged in manufacturing or other pursuits requiring the use of standards or standard measuring instruments. All requests for the services of the bureau shall be made in accordance with the rules and regulations herein established.

SEC. 4. That the officers and employees of the bureau shall consist of a director, at an annual salary of five thousand dollars; one physicist, at an annual salary of three thousand five hundred dollars; one chemist, at an annual salary of three thousand five hundred dollars; two assistant physicists or chemists, each at an annual salary of two thousand two hundred dollars; one laboratory assistant, at an annual salary of one thousand four hundred dollars; one laboratory assistant, at an annual salary of one thousand two hundred dollars; one secretary, at an annual salary of two thousand dollars; one clerk, at an annual salary of one thousand two hundred dollars; one messenger, at an annual salary of seven hundred and twenty dollars; one engineer, at an annual salary of one thousand five hundred dollars; one mechanician, at an annual salary of one thousand four hundred dollars; one watchman, at an annual salary of seven hundred and twenty dollars, and one laborer, at an annual salary of six hundred dollars.

SEC. 5. That the director shall be appointed by the President, by and with the advice and consent of the Senate. He shall have the general supervision of the bureau, its equipment, and the exercise of its functions. He shall make an annual report to the Secretary of the Treasury, including an abstract of the work done during the year and a financial statement. He may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the bureau in the exercise of its functions.

SEC. 6. That the officers and employees provided for by this Act, except the director, shall be appointed by the Secretary of the Treasury, at such time as their respective services may become necessary.

SEC. 7. That the following sums of money are hereby appropriated: For the payment of salaries provided for by the Act, the sum of twenty-seven thousand one hundred and forty dollars, or so much thereof as may be necessary; toward the erection of a suitable laboratory, of fireproof construction, for the use and occupation of said bureau, including all permanent fixtures, such as plumbing, piping, wiring, heating, lighting, and ventilation, the entire cost of which shall not exceed the sum of two hundred and fifty thousand dollars, one hundred thousand dollars; for equipment of said laboratory, the sum of ten thousand dollars; for a site for said laboratory, to be approved by the visiting committee hereinafter provided for and purchased by the Secretary of the Treasury, the sum of twenty-five thousand dollars, or so much thereof as may be necessary; for the payment of the general expenses of said bureau, including books and periodicals, furniture, office expenses, stationery and printing, heating and lighting, expenses of the visiting committee, and contingencies of all kinds, the sum of five thousand dollars, or so much thereof as may be necessary, to be expended under the supervision of the Secretary of the Treasury.

SEC. 8. That for all comparisons, calibrations, tests, or investigations, except those performed for the Government of the United States or State governments within the United States, a reasonable fee shall be charged, according to a schedule submitted by the director and approved by the Secretary of the Treasury.

SEC. 9. That the Secretary of the Treasury shall, from time to time, make regulations regarding the payment of fees, the limits of tolerance to be attained in standards submitted for verification, the sealing of standards, the disbursement and receipt of moneys, and such other matters as he may deem necessary for carrying this Act into effect.

SEC. 10. That there shall be a visiting committee of five members, to be appointed by the Secretary of the Treasury, to consist of men prominent in the various interests involved, and not in the employ of the Government. This committee shall visit the bureau at least once a year, and report to the Secretary of the Treasury upon the efficiency of its scientific work and the condition of its equipment. The members of this committee shall serve without compensation, but shall be paid the actual expenses incurred in attending its meetings. The period of service of the members of the original committee shall be so arranged that one member shall retire each year, and the appointments thereafter to be for a period of five years. Appointments made to fill vacancies occurring other than in the regular manner are to be made for the remainder of the period in which the vacancy exists.

Approved, March 3, 1901.

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May 20, 1918, 40 Stat 556 (Public Law 152—65th Congress, 2d session) "Overman Act."

First official interagency transfer of funds to the Bureau of Standards. The work was done in support of military agencies during World War I.

CHAP. 78.—An Act Authorizing the President to coordinate or consolidate executive bureaus, agencies, and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the national security and defense, for the successful prosecution of the war, for the support and maintenance of the Army and Navy, for the better utilization of resources and industries, and for the more effective exercise and more efficient administration by the President of his powers as Commander in Chief of the land and naval forces the President is hereby authorized to make such redistribution of functions among executive agencies as he may deem necessary, including any functions, duties, and powers hitherto by law conferred upon any executive department, commission, bureau, agency, office, or officer, in such manner as in his judgment shall seem best fitted to carry out the purposes of this Act, and to this end is authorized to make such regulations and to issue such orders as he may deem necessary, which regulations and orders shall be in writing and shall be filed with the head of the department affected and constitute a public record: *Provided,* That the Act shall remain in force during the continuance of the present war and for six months after the termination of the war by the proclamation of the treaty of peace, or at such earlier time as the President may designate: *Provided further,* That the termination of this Act shall not affect any act done or any right or obligation accruing or accrued pursuant to the Act and during the time that this Act is in force: *Provided further,* That the authority by this Act granted shall be exercised only in matters relating to the conduct of the present war.

SEC. 2. That in carrying out the purposes of this Act the President is authorized to utilize, coordinate, or consolidate any executive or administrative commissions, bureaus, agencies, offices, or officers now existing by law, to transfer any duties or powers from one existing department, commission, bureau, agency, office, or officer to another, to transfer the personnel thereof or any part of it either by detail or assignment, together with the whole or any part of the records and public property belonging thereto.

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May 29, 1920, 41 Stat 681 (Public Law 231—66th Congress, 2d session)

Beginning of transferred funds to the Bureau of Standards as authorized in appropriations legislation.

CHAP. 214.—An Act Making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1921, and for other purposes.

During the fiscal year 1921, the head of any department or independent establishment of the Government having funds available for scientific investigations and requiring cooperative work by the Bureau of Standards on scientific investigations within the scope of the functions of that Bureau, and which it is unable to perform within the limits of its appropriations, may, with the approval of the Secretary of Commerce, transfer to the Bureau of Standards such sums as may be necessary to carry on such investigations. The Secretary of the Treasury shall transfer on the books of the Treasury Department any sums which may be authorized hereunder and such amounts shall be placed to the credit of the Bureau of Standards for the performance of work for the department or establishment from which the transfer is made. (41 Stat. 683)

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May 14, 1930, 46 Stat. 327 (Public Law 219—71st Congress, 2d session)

CHAP. 275.—An Act Authorizing the establishment of a national hydraulic laboratory in the Bureau of Standards of the Department of Commerce and the construction of a building therefor.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be established in the Bureau of Standards of the Department of Commerce a national hydraulic laboratory for the determination of fundamental data useful in hydraulic research and engineering, including laboratory research relating to the behavior and control of river and harbor waters, the study of hydraulic structures and water flow, and the development and testing of hydraulic instruments and accessories: *Provided,* That no test, study, or other work on a problem or problems connected with a project the prosecution of which is under the jurisdiction of any department or independent agency of the government shall be undertaken in the laboratory herein authorized until a written request to do such work is submitted to the Director of the Bureau of Standards by the head of the department or independent agency charged with the execution of such project: *And provided further,* That any State or political subdivision thereof may obtain a test, study, or other work on a problem connected with a project the prosecution of which is under the jurisdiction of such State or political subdivision thereof.

SEC. 2. There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, not to exceed $350,000, to be expended by the Secretary of Commerce for the construction and installation upon the present site of the Bureau of Standards in the District of Columbia of a suitable hydraulic laboratory building and such equipment, utilities, and appurtenances thereto as may be necessary.

Approved, May 14, 1930.

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June 30, 1932, 47 Stat. 382 (Public Law 212—72d Congress, 1st session) "Economy Act of 1932."

SEC. 312—An amendment to section 8 of the Act establishing the National Bureau of Standards authorized payment of fees, except for other Federal agencies, for Bureau of Standards tests and calibrations.

SEC. 601—The policy of transferred funds was restated and made general throughout the Federal Government.

[CHAPTER 314]

AN ACT

Making appropriations for the Legislative Branch of the Government for the fiscal year ending June 30, 1933, and for other purposes.

SEC. 312. Section 8 of the Act entitled "An Act to establish the National Bureau of Standards", approved March 3, 1901, as amended and supplemented [U.S.C., title 15, sec. 276], is amended to read as follows:

"SEC. 8. For all comparisons, calibrations, tests, or investigations, performed by the National Bureau of Standards under the provisions of this Act, as amended and supplemented, except those performed for the Government of the United States or State governments within the United States, a fee sufficient in each case to compensate the National Bureau of Standards for the entire cost of the services rendered shall be charged, according to a schedule prepared by the Director of the National Bureau of Standards and approved by the Secretary of Commerce. All moneys received from such sources shall be paid into the Treasury to the credit of miscellaneous receipts." (47 Stat. 410)

. . . . . .

SEC. 601. Section 7 of the Act entitled "An Act making appropriations for fortifications and other works of defense, for the armament thereof, and for the procurement of heavy ordnance for trial and service, for the fiscal year ending June 30, 1921, and for other purposes", approved May 21, 1920 [U.S.C., title 31, sec. 686], is amended to read as follows:

"SEC. 7. (a) Any executive department or independent establishment of the Government, or any bureau or office thereof, if funds are available therefor and if it is determined by the head of such executive department, establishment, bureau, or office to be in the interest of the Government so to do, may place orders with any other such department, establishment, bureau, or office for materials, supplies, equipment, work, or services of any kind that such requisitioned Federal agency may be in a position to supply or equipped to render, and shall pay promptly by check to such Federal agency as may be requisitioned, upon its written request, either in advance or upon the furnishing or performance thereof, all or part of the estimated or actual cost thereof, as determined by such department, establishment, bureau, or office as may be requisitioned; but proper adjustments on the basis of the actual cost of the materials, supplies, or equipment furnished, or work or services performed, paid for in advance, shall be made as may be agreed upon by the departments, establishments, bureaus, or offices concerned: *Provided, however,* That if such work or services can be as conveniently or more cheaply performed by private agencies such work shall be let by competitive bids to such private agencies. Bills rendered, or requests for advance payments made, pursuant to any such order, shall not be subject to audit or certification in advance of payment. (47 Stat. 417)

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August 1, 1947, 61 Stat. 715 (Public Law 313—80th Congress, 1st session)

From time to time amendments to this act extended the authority to other agencies, revised the number of positions allotted, and the salary range. In 1965, NBS had twelve appointees under this law.

[CHAPTER 433]

AN ACT

To authorize the creation of additional positions in the professional and scientific service in the War and Navy Departments.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War is authorized to establish and fix the compensation for, within the War Department, not more than thirty positions, and the Secretary of the Navy is authorized to establish and fix the compensation for, within the Naval establishment, not more than fifteen positions in the professional and scientific service, each such position being established to effectuate those research and development functions, relating to the national defense, military and naval medicine, and any and all other activities of the War Department or Naval Establishment which require the services of specially qualified scientific or professional personnel: *Provided,* That the rates of compensation for positions established pursuant to the provisions of this Act shall not be less than $10,000 per annum nor more than $15,000 per annum, and shall be subject to the approval of the Civil Service Commission.

SEC. 2. Positions created pursuant to this Act shall be included in the classified civil service of the United States, but appointments to such positions shall be made without competitive examination upon approval of the proposed appointee's qualifications by the Civil Service Commission or such officers or agents as it may designate for this purpose.

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October 15, 1949, 63 Stat. 886 (Public Law 366—81st Congress, 1st session)
Authorization for the Boulder Laboratories.

[CHAPTER 703]

AN ACT

To authorize the construction and equipment of a radio laboratory building for the National Bureau of Standards, Department of Commerce.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be constructed and equipped for the National Bureau of Standards a suitable radio laboratory building, together with necessary utilities and appurtenances thereto, under a limit of cost of $4,475,000: *Provided,* That such limit of cost may be exceeded or shall be reduced by an amount equal to the percentage increase or decrease, if any, in construction costs generally dating from March 1, 1948, as determined by the Federal works Administrator.

SEC. 2. The Secretary of Commerce is authorized to acquire, by purchase, condemnation, or otherwise (including transfer with or without compensation from Federal agencies), such lands, estates in lands, and appurtenances thereto as may in his opinion be necessary or desirable for the construction of buildings to house activities of the National Bureau of Standards: *Provided,* That the site therefor shall be selected after consultation with the Director of the National Bureau of Standards.

SEC. 3. There are hereby authorized to be appropriated to the Secretary of Commerce, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary to carry out the provisions of this Act: *Provided,* That such sums so appropriated, except such part thereof as may be necessary for the incidental expenses of the Department of Commerce, shall be transferred to the Public Buildings Administration in the Federal works Agency.

Approved October 25, 1949.

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October 25, 1949, 63 Stat. 905 (Public Law 386—81st Congress, 1st session)
Authorization for a guided-missile research laboratory ultimately located on the site of a former United States Naval Hospital at Corona, California.

[CHAPTER 728]

AN ACT

To authorize the construction and equipment of a guided-missile research laboratory building for the National Bureau of Standards, Department of Commerce.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be constructed and equipped for the National Bureau of Standards a research laboratory building, suitable for use as a guided-missile laboratory, together with necessary utilities and appurtenances thereto, under a limit of cost of $1,900,000: *Provided,* That such limit of cost may be exceeded or shall be reduced by an amount equal to the percentage increase or decrease, if any, in construction cost generally dating from June 1, 1948, as determined by the Federal Works Administrator: *Provided further,* That such limit of cost shall not be exceeded by more than 10 per centum.

SEC. 2. The Secretary of Commerce is authorized to acquire, by purchase, condemnation, or otherwise (including transfer with or without compensation from Federal agencies), such lands, estates in lands, and appurtenances thereto as may in his opinion be necessary or desirable for the construction of a building to house activities of such laboratory for the National Bureau of Standards: *Provided*, That the site therefor shall be selected after consultation with the Director of the National Bureau of Standards.

SEC. 3. There are hereby authorized to be appropriated to the Secretary of Commerce, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary to carry out the provisions of this Act: *Provided,* That such sums so appropriated, except such part thereof as may be necessary for the incidental expenses of the Department of Commerce, shall be transferred to the Public Buildings Administration in the Federal Works Agency.

Approved October 25, 1949.

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October 28, 1949, 63 Stat. 954 (Public Law 429—81st Congress, 1st session) *Classification Act of 1949.*

The number of positions for the whole Civil Service in grades GS-16, GS-17, and GS-18 were specified. Periodic revisions in number and salary were made. In 1965, the National Bureau of Standards had 39 appointees in GS-16 and 29 in GS-17.

[CHAPTER 782]

AN ACT

To establish a standard schedule of rates of basic compensation for certain employees of the Federal Government; to provide an equitable system for fixing and adjusting the rates of basic compensation of individual employees; to repeal the Classification Act of 1923, as amended; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Classification Act of 1949".

TITLE I—DECLARATION OF POLICY

SEC. 101. It is the purpose of this Act to provide a plan for classification of positions and for rates of basic compensation whereby—

(1) in determining the rate of basic compensation which an officer or employee shall receive, (A) the principle of equal pay for substantially equal work shall be followed, and (B) variations in rates of basic compensation paid to different officers and employees shall be in proportion to substantial differences in the difficulty, responsibility, and qualification requirements of the work performed and to the contributions of officers and employees to efficiency and economy in the service; and

(2) individual positions shall, in accordance with their duties, responsibilities, and qualification requirements, be so grouped and identified by classes and grades, as defined in section 301, and the various classes shall be so described in published standards, as provided for in title IV, that the resulting position-classification system can be used in all phases of personnel administration.

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January 23, 1950, 3 C.F.R. 76 (1950).

EXECUTIVE ORDER 10096

PROVIDING FOR A UNIFORM PATENT POLICY FOR THE GOVERNMENT WITH RESPECT TO INVENTIONS MADE BY GOVERNMENT EMPLOYEES AND FOR THE ADMINISTRATION OF SUCH POLICY.

WHEREAS inventive advances in scientific and technological fields frequently result from governmental activities carried on by Government employees; and

WHEREAS the Government of the United States is expending large sums of money annually for the conduct of these activities; and

WHEREAS these advances constitute a vast national resource; and

WHEREAS it is fitting and proper that the inventive product of functions of the Government, carried out by Government employees, should be available to the Government in appropriate instances; and

WHEREAS the rights of Government employees in their inventions should be recognized in appropriate instances; and

WHEREAS the carrying out of the policy of this order requires appropriate administrative arrangements:

NOW, THEREFORE, by virtue of the authority vested in me by the Constitution and statutes, and as President of the United States and Commander in Chief of the Armed Forces of the United States, in the interest of the establishment and operation of a uniform patent policy for the Government with respect to inventions made by Government employees, it is hereby ordered as follows:

1. The following basic policy is established for all Government agencies with respect to inventions hereafter made by any Government employee:

(a) The Government shall obtain the entire right, title and interest in and to all inventions made by any Government employee (1) during working hours, or (2) with a contribution by the Government of facilities, equipment, materials, funds, or information, or of time or services of other Government

employees on official duty, or (3) which bears a direct relation to or are made in consequence of the official duties of the inventor.

(b) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a) last above, to the invention is insufficient equitably to justify a requirement of assignment to the Government of the entire right, title and interest to such invention, or in any case where the Government has insufficient interest in an invention to obtain entire right, title and interest therein (although the Government could obtain same under paragraph (a) above), the Government agency concerned, subject to the approval of the Chairman of the Government Patents Board . . . shall leave title to such invention in the employee, subject, however, to the reservation to the Government of a nonexclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, such reservation, in the terms thereof, to appear, where practicable, in any patent, domestic or foreign, which may issue on such invention. . . .

* * * * *

March 13, 1950, effective May 24, 1950, 64 Stat. 1263 (Reorganization Plan No. 5 of 1950)

The functions of all the officers of the National Bureau of Standards were transferred to the Secretary of Commerce, with power vested in him to authorize their performance or the performance of any of his functions by any of the officers or employees of the National Bureau of Standards.

REORGANIZATION PLAN NO. 5 OF 1950

Prepared by the President and transmitted to the Senate and the House of Representatives in Congress assembled, March 13, 1950, pursuant to the provisions of the Reorganization Act of 1949, approved June 20, 1949.

DEPARTMENT OF COMMERCE

SECTION 1. *Transfer of functions to the Secretary.*—(a) Except as otherwise provided in subsection (b) of this section, there are hereby transferred to the Secretary of Commerce all functions of all other officers of the Department of Commerce and all functions of all agencies and employees of such Department. . . .

SEC. 2. *Performance of functions of Secretary.*—The Secretary of Commerce may from time to time make such provisions as he shall deem appropriate authorizing the performance by any other officer, or by any agency or employee, of the Department of Commerce of any function of the Secretary, including any function transferred to the Secretary, including any function transferred to the Secretary by the provisions of this reorganization plan. . . .

SEC. 4. *Incidental transfers.*—The Secretary of Commerce may from time to time effect such transfers with the Department of Commerce of any of the records, property, personnel, and unexpended balances (available or to be made available) of appropriations, allocations, and other funds of such Department as he may deem necessary in order to carry out the provisions of this reorganization plan.

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June 29, 1950, 64 Stat. 275 (Public Law 583, 81st Congress, 2d session) *Deficiency Appropriation Act, 1950.*

Beginning of the Working Capital Fund for the National Bureau of Standards.

[CHAPTER 405]

AN ACT

Making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1950, and for other purposes.

NATIONAL BUREAU OF STANDARDS
WORKING CAPITAL FUND

For the establishment of a working capital fund, to be available without fiscal year limitation, for expenses necessary for the maintenance and operation of the National Bureau of Standards, including the furnishing of facilities and services to other Government agencies, not to exceed $3,000,000. Said fund shall be established as a special deposit account and shall be reimbursed from applicable appropriations of said Bureau for

the work of said Bureau, and from funds of other Government agencies for facilities and services furnished to such agencies pursuant to law. Reimbursements so made shall include handling and related charges; reserves for depreciation of equipment and accrued leave; and building construction and alterations directly related to the work for which reimbursement is made. (64 Stat. 279)

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July 21, 1950, 64 Stat. 369 (Public Law 617, 81st Congress, 2d session)

The basic definitions of the act of 1894 were kept but eliminated the alternative definitions specifying devices which were not correct, gave clear legal effect in the United States to a world-wide agreement on electrical units and standards which had been obtained by the National Bureau of Standards, and established in scientific terms definitions of the units of light which had never been specifically established by Federal statutes.

[CHAPTER 484]

AN ACT

To redefine the units and establish the standards of electrical and photometric measurements.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the date this Act is approved, the legal units of electrical and photometric measurement in the United States of America shall be those defined and established as provided in the following sections.

SEC. 2. The unit of electrical resistance shall be the ohm, which is equal to one thousand million units of resistance of the centimeter-gram-second system of electromagnetic units.

SEC. 3. The unit of electric current shall be the ampere, which is one-tenth of the unit of current of the centimeter-gram-second system of electromagnetic units.

SEC. 4. The unit of electromotive force and of electric potential shall be the volt, which is the electromotive force that, steadily applied to a conductor whose resistance is one ohm, will produce a current of one ampere.

SEC. 5. The unit of electric quantity shall be the coulomb, which is the quantity of electricity transferred by a current of one ampere in one second.

SEC. 6. The unit of electrical capacitance shall be the farad, which is the capacitance of a capacitor that is charged to a potential of one volt by one coulomb of electricity.

SEC. 7. The unit of electrical inductance shall be the henry, which is the inductance in a circuit such that an electromotive force of one volt is induced in the circuit by variation of an inducing current at the rate of one ampere per second.

SEC. 8. The unit of power shall be the watt, which is equal to ten million units of power in the centimeter-gram-second system, and which is the power required to cause an unvarying current of one ampere to flow between points differing in potential by one volt.

SEC. 9. The units of energy shall be (a) the joule, which is equivalent to the energy supplied by a power of one watt operating for one second, and (b) the kilowatt-hour, which is equivalent to the energy supplied by a power of one thousand watts operating for one hour.

SEC. 10. The unit of intensity of light shall be the candle, which is one-sixtieth of the intensity of one square centimeter of a perfect radiator, known as a "black body", when operated at the temperature of freezing platinum.

SEC. 11. The unit of flux of light shall be the lumen, which is the flux in a unit of solid angle from a source of which the intensity is one candle.

SEC. 12. It shall be the duty of the Secretary of Commerce to establish the values of the primary electric and photometric units in absolute measure, and the legal values for these units shall be those represented by, or derived from, national reference standards maintained by the Department of Commerce.

SEC. 13. The Act of July 12, 1894 (Public Law Numbered 105, Fifty-third Congress), entitled "An Act to define and establish the units of electrical measure", is hereby repealed.

Approved July 21, 1950.

* * * * *

July 22, 1950, 64 Stat. 371 (Public Law 619, 81 Congress, 2d session)

First major restatement of Bureau functions since 1901. The Act rewrote section 2 in its entirety and expanded its provisions to cover the standards and measurements functions and activities of the Department of Commerce.

[CHAPTER 486]

AN ACT

To amend section 2 of the Act of March 3, 1901 (31 Stat. 1449), to provide basic authority for the performance of certain functions and activities of the Department of Commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2 of the Act of March 3, 1901 (31 Stat. 1449), as amended, be, and the same hereby is, further amended so as to read in full as follows:

"SEC. 2. The Secretary of Commerce (hereinafter referred to as the 'Secretary') is authorized to undertake the following functions:

"(a) The custody, maintenance, and development of the national standards of measurement, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government.

"(b) The determination of physical constants and properties of materials when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

"(c) The development of methods for testing materials, mechanisms, and structures, and the testing of materials, supplies, and equipment, including items purchased for use of Government departments and independent establishments.

"(d) Cooperation with other governmental agencies on scientific and technical problems.

"(e) Advisory service to Government agencies on scientific and technical problems.

"(f) Invention and development of devices to serve special needs of the Government.

"In carrying out the functions enumerated in the section, the Secretary is authorized to undertake the following activities and similar ones for which need may arise in the operations of Government agencies, scientific institutions, and industrial enterprises:

"(1) the construction of physical standards;

"(2) the testing, calibration, and certification of standards and standard measuring apparatus;

"(3) the study and improvement of instruments and methods of measurements;

"(4) the investigation and testing of railroad track scales, elevator scales, and other scales used in weighing commodities for interstate shipment;

"(5) cooperation with the States in securing uniformity in weights and measures laws and methods of inspection;

"(6) the preparation and distribution of standard samples such as those used in checking chemical analyses, temperature, color, viscosity, heat of combustion, and other basic properties of materials; also the preparation and sale or other distribution of standard instruments, apparatus and materials for calibration of measuring equipment;

"(7) the development of methods of chemical analysis and synthesis of materials, and the investigation of the properties of rare substances;

"(8) the study of methods of producing and of measuring high and low temperatures; and the behavior of materials at high and at low temperatures;

"(9) the investigation of radiation, radioactive substances, and X-rays, their uses, and means of protection of persons from their harmful effects;

"(10) the study of the atomic and molecular structure of the chemical elements, with particular reference to the characteristics of the spectra emitted, the use of spectral observations in determining chemical composition of materials, and the relation of molecular structure to the practical usefulness of materials;

"(11) the broadcasting of radio signals for standard frequency;

"(12) the investigation of the conditions which affect the transmission of radio waves from their source to a receiver;

"(13) the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operation;

"(14) the study of new technical processes and methods of fabrication of materials in which the Government has a special interest; also the study of methods of measurement and technical processes used in the manufacture of optical glass and pottery, brick, tile, terra cotta, and other clay products;

"(15) the determination of properties of building materials and structural element, and encouragement of their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

"(16) metallurgical research, including study of alloy steels and light metal alloys; investigation of foundry practice, casting, rolling, and forging; prevention of corrosion of metals and alloys; behavior of bearing metals; and development of standards for metals and sands;

"(17) the operation of a laboratory of applied mathematics;

"(18) the prosecution of such research in engineering, mathematics, and the physical sciences as may be necessary to obtain basic data pertinent to the functions specified herein; and

"(19) the compilation and publication of general scientific and technical data resulting from the performance of the functions specified herein or from other sources when such data are of importance to scientific or manufacturing interests or to the general public, and are not available elsewhere, including demonstrations of the results of the Bureau's work by exhibits or otherwise as may be deemed most effective."

SEC. 2. The Act of March 3, 1901 (31 Stat. 1449), as amended, be, and the same hereby is, further amended by inserting at the end thereof the following sections:

"SEC. 11. For all services rendered for other Government agencies by the Secretary in the performance of functions specified herein, the Department of Commerce may be reimbursed in accordance with section 601 of the Economy Act of June 30, 1932.

"SEC. 12. In the absence of specific agreement to the contrary, equipment purchased by the Department of Commerce from transferred or advanced funds in order to carry out an investigation authorized herein for another Government agency shall become the property of the Department of Commerce for use in subsequent investigations.

"SEC. 13. (a) The Secretary of Commerce is authorized to accept and utilize gifts or bequests of real or personal property for the purpose of aiding and facilitating the work authorized herein.

"(b) For the purpose of Federal income, estate, and gift taxes, gifts and bequests accepted by the Secretary of Commerce under the authority of the Act shall be deemed to be gifts and bequests to or for the use of the United States."

Approved July 22, 1950

* * * * *

September 9, 1950, 64 Stat. 823 (Public Law 776—81st Congress, 2d session)

The Technical Documentation Center in the Department of Commerce was transferred to the National Bureau of Standards in 1964. Reorganized and renamed the Clearinghouse for Federal Scientific and Technical Information, it provided inexpensive unclassified information about government-sponsored research and development in national programs.

[CHAPTER 936]

AN ACT

To provide for the dissemination of technological, scientific, and engineering information to American business and industry, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the purpose of this Act is to make the results of technological research and development more readily available to industry and business, and to the general public, by clarifying and defining the functions and responsibilities of the Department of Commerce as a central clearinghouse for technical information which is useful to American industry and business.

CLEARINGHOUSE FOR TECHNICAL INFORMATION

SEC. 2. The Secretary of Commerce (hereinafter referred to as the "Secretary") is hereby directed to establish and maintain within the Department of Commerce a clearinghouse for the collection and dissemination of scientific, technical, and engineering information, and to this end to take such steps as he may deem necessary and desirable—

(a) To search for, collect, classify, coordinate, integrate, record, and catalog such information from whatever sources, foreign and domestic, that may be available;

(b) To make such information available to industry and business, to State and local governments, to other agencies of the Federal Government, and to the general public, through the preparation of abstracts, digests, translations, bibliographies, indexes, and microfilm and other reproductions, for distribution either directly or by utilization of business, trade, technical, and scientific publications and services;

(c) To effect, within the limits of his authority as now or hereafter defined by law, and with the consent of competent authority, the removal of restrictions on the dissemination of scientific and technical data in cases where consideration of national security permit the release of such data for the benefit of industry and business.

* * * * *

June 30, 1953, 67 Stat. 111 (Public Law 88—83d Congress, 1st session) *Flammable Fabrics Act.*

Mandatory flammability standards were set for wearing apparel and fabrics in interstate commerce. The standards relied on the voluntary commercial standards adopted by industry working with the National Bureau of Standards over several years to produce these standards for the industry.

Public Law 88 CHAPTER 164

AN ACT

To prohibit the introduction or movement in interstate commerce of articles of wearing apparel and fabrics which are so highly flammable as to be dangerous when worn by individuals, and for other purposes.

STANDARD OF FLAMMABILITY

SEC. 4. (a) Any fabric or article of wearing apparel shall be deemed so highly flammable within the meaning of section 3 of this Act as to be dangerous when worn by individuals if such fabric or any uncovered or exposed part of such article of wearing apparel exhibits rapid and intense burning when tested under the conditions and in the manner prescribed in the Commercial Standard promulgated by the Secretary of Commerce effective January 30, 1953, and identified as "Flammability of Clothing Textiles, Commercial Standard 191-53", or exhibits a rate of burning in excess of that specified in paragraph 3.11 of the Commercial Standard promulgated by the Secretary of Commerce effective May 22, 1953, and identified as "General Purpose Vinyl Plastic Film, Commercial Standard 192-53". For the purposes of this Act, such Commercial Standard 191-53 shall apply with respect to the hats, gloves, and footwear.

(b) If at any time the Secretary of Commerce finds that the Commercial Standards referred to in subsection (a) of this section are inadequate for the protection of the public interest, he shall submit to the Congress a report setting forth his findings together with such proposals for legislation as he deems appropriate. (67 Stat. 112)

* * * * *

June 20, 1956, 70 Stat. 314 (Public Law 604—84th Congress, 2d session)

Formal approval for the construction of new Bureau laboratories at Gaithersburg.

Public Law 604 CHAPTER 415

AN ACT

Making appropriations for the Department of Commerce and related agencies for the fiscal year ending June 30, 1957, and for other purposes.

Construction of facilities: For acquisition of necessary land and to initiate the design of the facilities to be constructed thereon for the National Bureau of Standards outside of the District of Columbia to remain available until expended, $930,000, to be transferred to the General Services Administration. (70 Stat. 321)

* * * * *

August 2, 1956, 70 Stat. 953 (Public Law 930—84th Congress, 2d session)

The Secretary of Commerce was directed to prescribe commercial standards for a safety device which would enable the refrigerator door to be opened from the inside. The National Bureau of Standards, with the cooperation of the refrigerator manufacturing industry, engaged in experiments to determine the basic criteria of reasonable safety which manufacturers could incorporate in the design of their refrigerators for preventing the suffocation of children entrapped in refrigerators.

Public Law 930 CHAPTER 890

AN ACT

To require certain safety devices on household refrigerators shipped in interstate commerce.

SEC. 3. The Secretary of Commerce shall prescribe and publish in the Federal Register commercial standards for devices which, when used in or on household refrigerators, will enable the doors thereof to be opened easily from the inside; and the standards first established under this section shall be so prescribed and published not later than one year after the date of the enactment of this Act.

* * * * *

August 3, 1956, 70 Stat. 959 (Public Law 940, 84th Congress, 2d session)

The Organic Act of the National Bureau of Standards was amended by Section 7 of this law which authorized the Bureau to retain fees received from the public for services performed, and allowed the Bureau to charge fixed prices for services performed for other agencies. Section 12 (a) incorporated authority for use of the Working Capital Fund in the Organic Act, and permitted changes in the accounting treatment under the fund.

Public Law 940

AN ACT

To amend the Act of March 3, 1901 (31 Stat. 1449) as amended, to incorporate in the Organic Act of the National Bureau of Standards the authority to use the Working Capital Fund, and to permit certain improvements in fiscal practices.

"SEC. 7. The Secretary shall charge for services performed under the authority of section 3 of this Act, except in cases where he determines that the interest of the Government would be best served by waiving the charge. Such charges may be based upon fixed prices or cost. The appropriation or fund bearing the cost of the services may be reimbursed, or the Secretary may require advance payment subject to such adjustment on completion of the work as may be agreed upon.

"SEC. 12. (a) The National Bureau of Standards is authorized to utilize in the performance of its functions the Working Capital Fund established by the Act of June 29, 1950 (64 Stat. 275), and additional amounts as from time to time may be required for the purposes of said fund are hereby authorized to be appropriated.

* * * * *

November 4, 1963, 77 Stat. 299 (Public Law 88-165, 88th Congress, 1st session)

Public Law 88-165

AN ACT

To amend the Act redefining the units and establishing the standards of electrical and photometric measurements to provide that the candela shall be the unit of luminous intensity.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act entitled "An Act to redefine the units and establish the standards of electrical and photometric measurement" (Act of July 21, 1950; (64 Stat. 370) is amended by deleting the word "candle" wherever it appears and inserting in lieu thereof the word "candela".

Approved November 4, 1963.

* * * * *

October 30, 1965, 79 Stat. 1127 (Public Law 89-306—89th Congress, 1st session) "Brooks Act"

As the technical representative of the Department of Commerce, the National Bureau of Standards established the Center for Computer Sciences and Technology to improve the effectiveness and efficiency of the government's use of computers.

Public Law 89-306

AN ACT

To provide for the economic and efficient purchase, lease, maintenance, operation, and utilization of automatic data processing equipment by Federal departments and agencies.

"AUTOMATIC DATA PROCESSING EQUIPMENT

"(f) The Secretary of Commerce is authorized (1) to provide agencies, and the Administrator of General Services in the exercise of the authority delegated in this section, with scientific and technological advisory services relating to automatic data processing and related systems, and (2) to make appropriate recommendations to the President relating to the establishment of uniform Federal automatic data processing standards. The Secretary of Commerce is authorized to undertake the necessary research in the sciences and technologies of automatic data processing computer and related systems, as may be required under provisions of this subsection. (70 Stat. 1128)

* * * * *

September 9, 1966, 80 Stat. 718 (Public Law 89-563—89th Congress, 2d session) *National Traffic and Motor Vehicle Safety Act of 1966.*

The Secretary of Commerce was to use the facilities of the National Bureau of Standards to initiate and conduct research, testing, development, and evaluation in cooperation with other Federal departments and agencies. The brake fluid and seat belt legislation passed in 1962 and 1963 was repealed by this broader law.

Public Law 89-563

AN ACT

To provide for a coordinated national safety program and establishment of safety standards for motor vehicles in interstate commerce to reduce accidents involving motor vehicles and to reduce the death and injuries occurring in such accidents.

SEC. 103. (f) In prescribing standards under this section, the Secretary shall—

(1) consider relevant available motor vehicle safety data, including the results of research, development, testing and evaluation activities conducted pursuant to the Act; . . . (80 Stat. 719)

* * * * *

October 15, 1966, 80 Stat. 931 (Public Law 89-670—89th Congress, 2d session) *Department of Transportation Act.*

The functions, powers, and duties given to the Secretary of Commerce under the *National Traffic and Motor Vehicle Safety Act of 1966* were transferred to the Secretary of Transportation. The Office of Vehicle Systems Research was formed at the National Bureau of Standards in March 1967.

Public Law 89-670

AN ACT

To establish a Department of Transportation and for other purposes.

TRANSFERS TO DEPARTMENT

SEC. 6. (a) There are hereby transferred to and vested in the Secretary all functions, powers, and duties of the Secretary of Commerce and other offices and officers of the Department of Commerce under—

(6) the following laws relating generally to traffic and highway safety:

(A) The National Traffic and Motor Vehicle Safety Act of 1966 (80 Stat. 718).

(B) The Highway Safety Act of 1966 (80 Stat. 731).

* * * * *

November 3, 1966, 80 Stat. 1296 (Public Law 89-755—89th Congress, 2d session) *Fair Packaging and Labeling Act.*

The National Bureau of Standards was given the responsibility to work with industry to reduce the number of package sizes, and to make labels more informative.

Public Law 89-755

AN ACT

To regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging or labeling of certain consumer commodities distributed in such commerce, and for other purposes.

SEC. 5. (d) Whenever the Secretary of Commerce determines that there is undue proliferation of the weights, measures, or quantities in which any consumer commodity or reasonably comparable consumer commodities are being distributed in packages for sale at retail and such undue proliferation impairs the reasonable ability of consumers to make value comparisons with respect to such consumer commodity or commodities, he shall request manufacturers, packers, and distributors of the commodity or commodities to participate in the development of a voluntary product standard for such commodity or commodities under the procedures for the development of voluntary products standards established by the Secretary pursuant to section 2 of the Act of March 3, 1901 (31 Stat. 1449, as amended; 15 U.S.C. 272). Such procedures shall provide adequate manufacturer, packer, distributor, and consumer representation.

(e) If (1) after one year after the date on which the Secretary of Commerce first makes the request of manufacturers, packers, and distributors to participate in the development of a voluntary product standard as provided in subsection (d) of this section, he determines that such a standard will not be published pursuant to the provisions of such subsection (d), or (2) if such a standard is published and the Secretary of Commerce determines that it has not been observed, he shall promptly report such determination to the Congress with a statement of the efforts that have been made under the voluntary standards program and his recommendation as to whether Congress should enact legislation providing regulatory authority to deal with the situation in question. (80 Stat. 1299)

. . . . . .

REPORTS TO THE CONGRESS

SEC. 8. Each officer or agency required or authorized by the Act to promulgate regulations for the packaging or labeling of any consumer commodity, or to participate in the development of voluntary product standards with respect to any consumer commodity under procedures referred to in section 5 (d) of this Act, shall transmit to the Congress in January of each year a report containing a full and complete description of the activities of that officer or agency for the administration and enforcement of this Act during the preceding fiscal year.

COOPERATION WITH STATE AUTHORITIES

SEC. 9. (a) A copy of each regulation promulgated under this Act shall be transmitted promptly to the Secretary of Commerce, who shall (1) transmit copies thereof to all appropriate State officers and agencies, and (2) furnish to such State officers and agencies information and assistance to promote to the greatest practicable extent uniformity in State and Federal regulation of the labeling of consumer commodities.

(b) Nothing contained in this section shall be construed to impair or otherwise interfere with any program carried into effect by the Secretary of Health, Education, and Welfare under other provisions of law in cooperation with State government or agencies, instrumentalities, or political subdivisions thereof. (80 Stat. 1300)

* * * * *

December 14, 1967, 81 Stat. 568 (Public Law 90-189—90th Congress, 1st session)

The Flammable Fabrics Act amendments provided a mechanism for continued evaluation and revision to keep the requirements up- to-date and extended coverage to flammable interior furnishings. The Secretary of Commerce was given the responsibility of developing mandatory flammability standards when necessary. NBS had the responsibility of providing the necessary technical information.

Public Law 90-189

AN ACT

To amend the Flammable Fabrics Act to increase the protection afforded consumers against injurious flammable fabrics.

SEC. 3. Section 4 of the Flammable Fabrics Act is amended to read as follows:

"REGULATION OF FLAMMABLE FABRICS

"SEC. 4. (a) Whenever the Secretary of Commerce finds on the basis of the investigations or research conducted pursuant to section 14 of this Act that a new or amended flammability standard or other regulation, including labeling, for a fabric, related material, or product may be needed to protect the public against unreasonable risk of the occurrence of fire leading to death or personal injury, or significant property damage, he shall institute proceedings for the determination of an appropriate flammability standard (including conditions and manner of testing) or other regulation or amendment thereto for such fabric, related material, or product.

"(b) Each standard, regulation, or amendment thereto promulgated pursuant to this section shall be based on findings that such standard, regulation, or amendment thereto is needed to adequately protect the public against unreasonable risk of the occurrence of fire leading to death, injury, or significant property damage, is reasonable, technologically practicable, and appropriate, is limited to such fabrics, related materials, or products which have been determined to present such unreasonable risks, and shall be stated in objective terms. Each such standard, regulation, or amendment thereto, shall become effective twelve months from the date on which such standard, regulation, or amendment is promulgated, unless the Secretary of Commerce finds for good cause shown that an earlier or later effective date is in the public interest and publishes the reason for such finding. Each such standard or regulation or amendment thereto shall exempt fabrics, related materials, or products in inventory or with the trade as of the date on which the standard, regulation, or amendment thereto, becomes effective except that, if the Secretary finds that any such fabric, related material, or product is so highly flammable as to be dangerous when used by consumers for the purpose for which it is intended, he may under such conditions as the Secretary may prescribe, withdraw, or limit the exemption for such fabric, related material, or product. (81 Stat. 569)

* * * * *

March 1, 1968, 82 Stat. 34 (Public Law 90-259—90th Congress, 2d session) *Fire Research and Safety Act of 1968.*

The Fire Research and Safety Office was created to carry out the activities of the program.

Public Law 90-259

AN ACT

To amend the Organic Act of the National Bureau of Standards to authorize a fire research and safety program, and for other purposes.

Title I—FIRE RESEARCH AND SAFETY PROGRAM

DECLARATION OF POLICY

SEC. 101. The Congress finds that a comprehensive fire research and safety program is needed in this country to provide more effective measures of protection against the hazards of death, injury, and damage to property. The Congress finds that it is desirable and necessary for the Federal Government, in carrying out the provisions of this title, to cooperate with and assist public and private agencies. The Congress declares that the purpose of this title is to amend the Act of March 3, 1901, as amended, to provide a national fire research and safety program including the gathering of comprehensive fire data; a comprehensive fire research program; fire safety education and training programs; and demonstrations of new approaches and improvements in fire prevention and control, and reduction of death, personal injury, and property damage. Additionally, it is the sense of Congress that the Secretary should establish a fire research and safety center for administering this title and carrying out its purposes, including appropriate fire safety liaison and coordination.

AUTHORIZATION OF PROGRAM

SEC. 102. The Act entitled "An Act to establish the National Bureau of Standards", approved March 3, 1901, as amended (15 U.S.C. 271-278e, is further amended by adding the following sections:

"SEC. 16. The Secretary of Commerce (hereinafter referred to as the 'Secretary') is authorized to—

"(a) Conduct directly or through contracts or grants—

"(1) investigations of fires to determine their causes, frequency of occurrence, severity, and other pertinent factors;

"(2) research into the causes and nature of fires, and the development of improved methods and techniques for fire prevention, fire control, and reduction of death, personal injury, and property damage;

"(3) educational programs to—

"(A) inform the public of fire hazards and fire safety techniques, and

"(B) encourage avoidance of such hazards and use of such techniques;

"(4) fire information reference services, including the collection, analysis, and dissemination of data, research results, and other information, derived from this program or from other sources and related to fire protection, fire control, and reduction of death, personal injury, and property damage;

"(5) educational and training programs to improve, among other things—

"(A) the efficiency, operation, and organization of fire services, and

"(B) the capability of controlling unusual fire-related hazards and fire disasters; and

"(6) projects demonstrating—

"(A) improved or experimental programs of fire prevention, fire control, and reduction of death, personal injury, and property damage,

"(B) application of fire safety principles in construction, or

"(C) improvement of the efficiency, operation, or organization of the fire services.

"(b) Support by contracts or grants the development, for use by educational and other nonprofit institutions, of—

"(1) fire safety and fire protection engineering or science curriculums; and

"(2) fire safety courses, seminars, or other instructional materials and aids for the above curriculums or other appropriate curriculums or courses of instruction.

"SEC. 17. With respect to the functions authorized by section 16 of this Act—

"(a) Grants may be made only to States and local governments, other non-Federal public agencies, and nonprofit institutions. Such a grant may be up to 100 per centum of the total cost of the project for which such grant is made. The Secretary shall require, whenever feasible, as a condition of approval of a grant, that the recipient contribute money, facilities, or services to carry out the purpose for which the grant is sought. For the purposes of this section, 'State' means any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Canal Zone, American Samoa, and the Trust Territory of the Pacific Islands; and 'public agencies' includes combinations or groups of States or local governments.

"(b) The Secretary may arrange with and reimburse the heads of other Federal departments and agencies for the performance of any such functions, and, as necessary or appropriate, delegate any of his powers under this section or section 16 of this Act with respect to any part thereof, and authorize the redelegation of such powers.

"(c) The Secretary may perform such functions without regard to section 3648 of the Revised Statutes (31 U.S.C. 529).

"(d) The Secretary is authorized to request any Federal department or agency to supply such statistics, data, program reports, and other materials as he deems necessary to carry out such functions. Each such department or agency is authorized to cooperate with the Secretary and, to the extent permitted by law, to furnish such materials to the Secretary. The Secretary and the heads of other departments and agencies engaged in administering programs related to fire safety shall, to the maximum extent practicable, cooperate and consult in order to insure fully coordinated efforts.

"(e) The Secretary is authorized to establish such policies, standards, criteria, and procedures and to prescribe such rules and regulations as he may deem necessary or appropriate to the administration of such functions or this section, including rules and regulations which—

"(1) provide that a grantee will from time to time, but not less often than annually, submit a report evaluating accomplishments of activities funded under section 16, and

"(2) provide for fiscal control, sound accounting procedures, and periodic reports to the Secretary regarding the application of funds paid under section 16."

* * * * *

July 11, 1968, 82 Stat. 339 (Public Law 90-396—90th Congress, 2d session) *Standard Reference Data Act.* This Act authorized the National Bureau of Standards to coordinate a National system for providing scientific data to science and industry, thereby strengthening and increasing the effectiveness of the Bureau's standard reference data operation.

Public Law 90-396

AN ACT

To provide for the collection, compilation, critical evaluation, publication, and sale of standard reference data.

DECLARATION OF POLICY

SECTION 1. The Congress hereby finds and declares that reliable standardized scientific and technical reference data are of vital importance to the progress of the Nation's science and technology. It is therefore the policy of the congress to make critically evaluated reference data readily available to scientists, engineers, and the general public. It is the purpose of this Act to strengthen and enhance this policy.

SEC. 2. For the purposes of this Act—

(a) The term "standard reference data" means quantitative information, related to a measurable physical or chemical property of a substance or system of substances of known composition and structure, which is critically evaluated as to its reliability under section 3 of this Act.

(b) The term "Secretary" means the Secretary of Commerce.

SEC. 3. The Secretary is authorized and directed to provide or arrange for the collection, compilation, critical evaluation, publication, and dissemination of standard reference data. In carrying out this program, the Secretary shall, to the maximum extent practicable, utilize the reference data services and facilities of other agencies and instrumentalities of the Federal Government and of State and local governments, persons, firms, institutions, and associations, with their consent and in such a manner as to avoid duplication of those services and facilities. All agencies and instrumentalities of the Federal Government are encouraged to exercise their duties and functions in such manner as will assist in carrying out the purpose of this Act. This section shall be deemed complementary to existing authority, and nothing herein is intended to repeal, supersede, or diminish existing authority or responsibility of any agency or instrumentality of the Federal Government.

SEC. 4. To provide for more effective integration and coordination of standard reference data activities, the Secretary, in consultation with other interested Federal agencies, shall prescribe and publish in the Federal Register such standards, criteria, and procedures for the preparation and publication of standard reference data as may be necessary to carry out the provisions of this Act.

SEC. 5. Standard reference data conforming to standards established by the Secretary may be made available and sold by the Secretary or by a person or agency designated by him. To the extent practicable and appropriate, the prices established for such data may reflect the cost of collection, compilation, evaluation, publication, and dissemination of the data, including administrative expenses; and the amounts received shall be subject to the Act of March 3, 1901, as amended (15 U.S.C. 271- 278e).

SEC. 6. (a) Notwithstanding the limitations contained in section 9 of title 17 of the United States Code, the Secretary may secure copyright and renewal thereof on behalf of the United States as author or proprietor in all or any part of any standard reference data which he prepares or makes available under this Act, and may authorize the reproduction and publication thereof by others.

(b) The publication or republication by the Government under this Act, either separately or in a public document, of any material in which copyright is subsisting shall not be taken to cause any abridgment or annulment of the copyright or to authorize any use or appropriation of such material without the consent of the copyright proprietor.

SEC. 7. There are authorized to be appropriated to carry out this Act, $1.86 million for the fiscal year ending June 30, 1969. Notwithstanding the provisions of any other law, no appropriations for any fiscal year may be made for the purpose of this Act after fiscal year 1969 unless previously authorized by the Congress.

SEC. 8. This Act may be cited as the "Standard Reference Data Act."

Approved July 11, 1968.

* * * * *

August 9, 1968, 82 Stat. 693 (Public Law 90-472—90th Congress, 2d session) "Metric System Study".

The Act authorized a study of the effect upon the United States of increased use of the Metric System throughout the world and development of recommendations for an action program to deal with the problem.

Public Law 90-472

AN ACT

To authorize the Secretary of Commerce to make a study to determine the advantages and disadvantages of increased use of the metric system in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce is hereby authorized to conduct a program of investigation, research, and survey to determine the impact of increasing worldwide use of the metric system on the United States; to appraise the desirability and practicability of increasing the use of metric weights and measures in the United States; to study the feasibility of retaining and promoting by international use of dimensional and other engineering standards based on the customary measurement units of the United States; and to evaluate the costs and benefits of alternative courses of action which may be feasible for the United States.

SEC. 2. In carrying out the program described in the first section of this Act, the Secretary, among other things, shall—

(1) investigate and appraise the advantages and disadvantages to the United States in international trade and commerce, and in military and other areas of international relations, of the increased use of an international standardized system of weights and measures;

(2) appraise economic and military advantages and disadvantages of the increased use of the metric system in the United States or of the increased use of such system in specific fields and the impact of such increased use upon those affected;

(3) conduct extensive comparative studies of the systems of weights and measures used in educational, engineering, manufacturing, commercial, public, and scientific areas, and the relative advantages and disadvantages, and degree of standardization of each in its respective field;

(4) investigate and appraise the possible practical difficulties which might be encountered in accomplishing the increased use of the metric system of weights and measures generally or in specific fields or areas in the United States;

(5) permit appropriate participation by representatives of United States industry, science, engineering, and labor, and their associations, in the planning and conduct of the program authorized by the first section of this Act, and in the evaluation of the information secured under such program; and

(6) consult and cooperate with other government agencies, Federal, State, and local, and, to the extent practicable, with foreign governments and international organizations.

SEC. 3. In conducting the studies and developing the recommendations required in this Act, the Secretary shall give full consideration to the advantages, disadvantages, and problems associated with possible changes in either the system of measurement units or the related dimensional and engineering standards currently used in the United States, and specifically shall—

(1) investigate the extent to which substantial changes in the size, shape, and design of important industrial products would be necessary to realize the benefits which might result from general use of metric units of measurement in the United States;

(2) investigate the extent to which uniform and accepted engineering standards based on the metric system of measurement units are in use in each of the fields under study and compare the extent to such use and the utility and degree of sophistication of such metric standards with those in use in the United States; and

(3) recommend specific means of meeting the practical difficulties and costs in those areas of the economy where any recommended change in the system of measurement units and related dimensional and engineering standards would raise significant practical difficulties or entail significant costs of conversion.

SEC. 4. The Secretary shall submit to the Congress such interim reports as he deems desirable, and within three years after the date of the enactment of this Act, a full and complete report of the findings made under the program authorized by this Act, together with such recommendations as he considers to be appropriate and in the best interests of the United States.

SEC. 5. From funds previously appropriated to the Department of Commerce, the Secretary is authorized to utilize such appropriated sums as are necessary, but not to exceed $500,000, to carry out the purposes of this Act for the first year of the program.

SEC. 6. This Act shall expire thirty days after the submission of the final report pursuant to section 3.

Approved August 9, 1968.

* * * * *

October 27, 1972, 86 Stat. 1207 (Public Law 92-573—92d Congress, 2d session) *Consumer Product Safety Act.*

This Act established the Consumer Product Safety Commission and transferred the regulatory functions of the Secretary of Commerce under the Flammable Fabrics Act and the "Refrigerator Safety Devices Act" to the Commission. The National Bureau of Standards provided technical support to the CPSC.

AN ACT

To protect consumers against unreasonable risk of injury from hazardous products, and for other purposes.

COOPERATION WITH STATES AND WITH OTHER FEDERAL AGENCIES

SEC. 29. (d) The Commission shall, to the maximum extent practicable, utilize the resources and facilities of the National Bureau of Standards, on a reimbursable basis, to perform research and analyses related to risks of injury associated with consumer products (including fire and flammability risks), to develop test methods, to conduct studies and investigations, and to provide technical advice and assistance in connection with the functions of the Commission.

TRANSFERS OF FUNCTIONS

SEC. 30. (a) The functions of the Secretary of Health, Education, and Welfare under the Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) and the Poison Prevention Packaging Act of 1970 are transferred to the Commission. The functions of the Administrator of the Environmental Protection Agency and of the Secretary of Health, Education, and Welfare under the Acts amended by subsections (b) through (f) of section 7 of the Poison Prevention Packaging Act of 1970, to the extent such functions relate to the administration and enforcement of the Poison Prevention Packaging Act of 1970, are transferred to the Commission.

(b) The functions of the Secretary of Health, Education, and Welfare, the Secretary of Commerce, and the Federal Trade Commission under the Flammable Fabrics Act (15 U.S.C. 1191 et seq.) are transferred to the Commission. The functions of the Federal Trade Commission under the Federal Trade Commission Act, to the extent such functions relate to the administration and enforcement of the Flammable Fabrics Act, are transferred to the Commission.

(c) The functions of the Secretary of Commerce and the Federal Trade Commission under the Act of August 2, 1956 (15 U.S.C. 1211) are transferred to the Commission.

(d) A risk of injury which is associated with consumer products and which could be eliminated or reduced to a sufficient extent by action taken under the Federal Hazardous Substances Act, the Poison Prevention Packaging Act of 1970, or the Flammable Fabrics Act may be regulated by the commission only in accordance with the provisions of those Acts.

(e) (1) (A) All personnel, property, records, obligations, and commitments, which are used primarily with respect to any function transferred under the provisions of subsections (a), (b) and (c) of this section shall be transferred to the Commission, except those associated with fire and flammability research in the National Bureau of Standards. The transfer of personnel pursuant to this paragraph shall be without reduction in classification or compensation for one year after such transfer, except that the Chairman of the Commission shall have full authority to assign personnel during such one-year period in order to efficiently carry out functions transferred to the Commission under this section. (86 Stat. 1231)

* * * * *

October 27, 1972, 86 Stat. 1234 (Public Law 92-574—92d Congress, 2d session) *Noise Control Act of 1972.*
The Administrator of the Environmental Protection Agency was authorized to conduct research on the effects, measurement, and control of noise.

Public Law 92-574

AN ACT

To control the emission of noise detrimental to the human environment, and for other purposes.

SEC. 14 (1) (B) development of improved methods and standards for measurement and monitoring of noise, in cooperation with the National Bureau of Standards, Department of Commerce; (86 Stat. 1245)

* * * * *

September 3, 1974, 88 Stat. 1069 (Public Law 93-409—93d Congress, 2d session) *Solar Heating and Cooling Demonstration Act of 1974.*

The National Bureau of Standards was directed to determine what constituted an effective solar heating and cooling system.

Public Law 93-409

AN ACT

To provide for the early development and commercial demonstration of the technology of solar heating and combined solar heating and cooling systems.

SEC. 2. (b) It is therefore declared to be the policy of the United States and the purpose of this Act to provide for the demonstration within a three-year period of the practical use of solar heating technology, and to provide for the development and demonstration within a five-year period of the practical use of combined heating and cooling technology. (88 stat. 1069)

DEFINITIONS

SEC. 3. For purposes of this Act—

(1) the term "solar heating", with respect to any building, means the use of solar energy to meet such portion of the total heating needs of such building (including hot water), or such portion of the needs of such building for hot water (where its remaining heating needs are met by other methods), as may be required under performance criteria prescribed by the Secretary of Housing and Urban Development utilizing the services of the Director of the National Bureau of Standards, and in consultation with the Director of the National Science Foundation, and the Administrator of the National Aeronautics and Space Administration;

(2) the terms "solar heating and cooling" and "combined solar heating and cooling", with respect to any building, mean the use of solar energy to provide both such portion of the total heating needs of such building (including hot water) and such portion of the total cooling needs of such building, or such portion of the needs of such building for hot water (where its remaining heating needs are met by other methods) and such portion of the total cooling needs of a building, as may be required under performance criteria prescribed by the Secretary of Housing and Urban Development utilizing the services of the Director of the National Bureau of Standards, and in consultation with the Director of the National Science Foundation, and the Administrator of the National Aeronautics and Space Administration, and such term includes cooling by means of nocturnal heat radiation, by evaporation, or by other methods of meeting peakload energy requirements at nonpeakload times; (88 Stat. 1070)

DEVELOPMENT AND DEMONSTRATION OF SOLAR HEATING SYSTEMS TO BE USED IN RESIDENTIAL DWELLINGS

SEC. 5. (a) The Administrator and the Secretary shall promptly initiate and carry out a program, as provided in this section, for the development and demonstration of solar heating systems (including collectors, controls, and thermal storage) for use in residential dwellings.

(b) (1) Within 120 days after the date of the enactment of this Act, the Secretary, utilizing the services of the Director of the National Bureau of Standards and in consultation with the Administrator and the Director, shall determine, prescribe, and publish—

(A) interim performance criteria for solar heating components and systems to be used in residential dwellings, and

(B) interim performance criteria (relating to suitability for solar heating) for such dwellings themselves, taking into account in each instance climatic variations existing between different geographic areas.

(2) As soon as possible after the publication of the performance criteria prescribed under paragraph (1), the Secretary, in consultation with the Director of the National Bureau of Standards and the Administrator, will select on the basis of open competition a number of designs for various types of residential dwellings suitable for and adapted to the installation of solar heating systems meeting the performance criteria prescribed under paragraph (1) (A). (88 Stat. 1070)

DEVELOPMENT AND DEMONSTRATION OF COMBINED SOLAR HEATING AND COOLING SYSTEMS TO BE USED IN RESIDENTIAL DWELLINGS

SEC. 6. (a) The Administrator and the Secretary shall promptly initiate and carry out a program, as provided in this section, for the development and demonstration of combined solar heating and cooling systems (including collectors, controls, and thermal storage) for use in residential dwellings.

(b) (1) As soon as possible after the date of the enactment of this Act, the Secretary, utilizing the services of the Director of the National Bureau of Standards and in consultation with the Administrator and the Director, shall determine, prescribe, and publish—

(A) interim performance criteria for combined solar heating and cooling components and systems to be used in residential dwellings, and

(B) interim performance criteria (relating to suitability for solar heating and cooling) for such dwellings themselves, taking into account in each instance climatic variations existing between different geographic areas.

(2) As soon as possible after the publication of the performance criteria prescribed under paragraph (1) (and if possible before the completion of the research and development provided for in subsection (c)), the Secretary, in consultation with the Director of the National Bureau of Standards and the Administrator, will select on the basis of open competition a number of designs for various types of residential dwellings suitable for and adapted to the installation of combined solar heating and cooling systems meeting the performance criteria prescribed under paragraph (1) (A). (88 Stat. 1072)

DEVELOPMENT AND DEMONSTRATION OF SOLAR HEATING AND COMBINED SOLAR HEATING AND COOLING SYSTEMS FOR COMMERCIAL BUILDINGS

SEC. 9. The Administrator, in consultation with the Secretary, the Director, the Administrator of General Services, and the Director of the National Bureau of Standards and concurrently with the conduct of the programs under sections 5 and 6, shall enter into arrangements with appropriate Federal agencies to carry out such projects and activities (including demonstration projects) with respect to apartment buildings, office buildings, factories, crop-drying facilities and other agricultural structures, public buildings (including schools and colleges), and other non-residential, commercial, or industrial buildings, taking into account the special needs of and individual differences in such buildings based upon size, function, and other relevant factors, as may be appropriate for the early development and demonstration of solar heating and combined solar heating and cooling systems suitable and effective for use in such buildings. (88 Stat. 1074)

COORDINATION, MONITORING, AND LIAISON

SEC. 11. (a) The Secretary, utilizing the services of the Director of the National Bureau of Standards and in coordination with such other Government agencies as may be appropriate, shall—

(1) monitor the performance and operation of solar heating and combined solar heating and cooling systems installed in residential dwellings under this Act;

(2) collect and evaluate data and information on the performance and operation of solar heating and combined solar heating and cooling systems installed in residential dwellings under this Act; and

(3) from time to time, carrying out such studies and investigations and take such other actions, including the submission of special reports to the Congress when appropriate, as may be necessary to assure that the programs for which the Secretary is responsible under this Act effectively carry out the policy of this Act. (88 Stat. 1074)

DISSEMINATION OF INFORMATION AND OTHER ACTIONS TO PROMOTE PRACTICAL USE OF SOLAR HEATING AND COOLING TECHNOLOGIES

SEC. 12. (a) The Secretary shall take all possible steps to assure that full and complete information with respect to the demonstrations and other activities conducted under this Act is made available to Federal, State, and local authorities, the building industry and related segments of the economy, the scientific and technical community, and the public at large, both during and after the close of the programs under this Act,

with the objective of promoting and facilitating to the maximum extent feasible the early and widespread practical use of solar energy for the heating and cooling of buildings throughout the United States. In accordance with regulations prescribed under section 16 such information shall be disseminated on a coordinated basis by the Secretary, the Administrator, the Director of the National Bureau of Standards, the Director, the Commissioner of the Patent Office, and other appropriate Federal offices and agencies. (88 Stat. 1075)

REGULATIONS

SEC. 16. The Administrator and the Secretary in consultation with the Director of the National Bureau of Standards, the Director, the Administrator of the General Services Administration, the Secretary of Defense, and other appropriate officers and agencies, shall prescribe such regulations as may be necessary or appropriate to carry out this Act promptly and efficiently. Each such officer or agency, in consultation with the Administrator and the Secretary, may prescribe such regulations as may be necessary or appropriate to carry out his or its particular functions under this Act promptly and efficiently. (88 Stat. 1078).

* * * * *

October 29, 1974, 88 Stat. 1535 (Public Law 93-498—93d Congress, 2d session) *Federal Fire Prevention and Control Act of 1974.*

The establishment of the Center for Fire Research reorganized and strengthened the fire research programs at the National Bureau of Standards.

Public Law 93-498

AN ACT

To reduce losses of life and property, through better fire prevention and control, and for other purposes.

PURPOSES

SEC. 3. It is declared to be the purpose of Congress in this Act to—

(1) reduce the Nation's losses caused by fire through better fire prevention and control;

(2) supplement existing programs of research, training, and activities by State and local governments;

(3) establish the National Fire Prevention and Control Administration and the Fire Research Center within the Department of Commerce; and

(4) establish an intensified program of research into the treatment of burn and smoke injuries and the rehabilitation of victims of fires within the National Institutes of Health. (88 Stat. 1536)

FIRE RESEARCH CENTER

SEC. 18. The Act of March 3, 1901 (15 U.S.C. 278), is amended by striking out sections 16 and 17 (as added by title I of the Fire Prevention and Control Act of 1968) and by inserting in lieu thereof the following new section:

"SEC. 16. (a) There is hereby established within the Department of Commerce a Fire Research Center which shall have the mission of performing and supporting research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires. The content and priorities of the research program shall be determined in consultation with the Administrator of the National Fire Prevention and Control Administration. In implementing this section, the Secretary is authorized to conduct, directly or through contracts or grants, a fire research program, including—

"(1) basic and applied fire research for the purpose of arriving at an understanding of the fundamental processes underlying all aspects of fire. Such research shall include scientific investigations of—

"(A) the physics and chemistry of combustion processes;

"(B) the dynamics of flame ignition, flame spread, and flame extinguishment;

"(C) the composition of combustion products developed by various sources and under various environmental conditions;

"(D) the early stages of fires in buildings and other structures, structural subsystems and structural components in all other types of fires, including, but not limited to, forest fires, brush fires, fires underground, oil blowout fires, and water-borne fires, with the aim of improving early detection capability;

"(E) the behavior of fires involving all types of buildings and other structures and their contents (including mobile homes and highrise buildings, construction materials, floor and wall coverings, coatings, furnishings, and other combustible materials), and all other types of fires, including forest fires, brush fires, fires underground, oil blowout fires, and waterborne fires;

"(F) the unique fire hazards arising from the transportation and use, in industrial and professional practices, of combustible gases, fluids, and materials;

"(G) design concepts for providing increased fire safety consistent with habitability, comfort, and human impact in buildings and other structures; and

"(H) such other aspects of the fire process as may be deemed useful in pursuing the objectives of the fire research program;

"(2) research into the biological, physiological, and psychological factors affecting human victims of fire, and the performance of individual members of fire services, including—

"(A) the biological and physiological effects of toxic substances encountered in fires;

"(B) the trauma, cardiac conditions, and other hazards resulting from exposure to fire;

"(C) the development of simple and reliable tests for determining the cause of death from fires;

"(D) improved methods of providing first aid to victims of fires;

"(E) psychological and motivational characteristics of persons who engage in arson, and the prediction and cure of such behavior;

"(F) the conditions of stress encountered by firefighters, the effects of such stress, and the alleviation and reduction of such conditions; and

"(G) such other biological, psychological, and physiological effects of fire as have significance for purposes of control or prevention of fires; and

"(3) operation tests, demonstration projects, and fire investigations in support of the activities set forth in this section.

"The Secretary shall insure that the results and advances arising from the work of the research program are disseminated broadly. He shall encourage the incorporation, to the extent applicable and practicable, of such results and advances in building codes, fire codes, and other relevant codes, test methods, fire service operations and training, and standards. The Secretary is authorized to encourage and assist in the development and adoption of uniform codes, test methods, and standards aimed at reducing fire losses and costs of fire protection.

"(b) For the purposes of this section there is authorized to be appropriated not to exceed $3,500,000 for the fiscal year ending June 30, 1975 and not to exceed $4,000,000 for the fiscal year ending June 30, 1976." (88 Stat. 1545).

* * * * *

December 31, 1974, 88 Stat. 1878 (Public Law 93-577—93d Congress, 2d session) *Federal Nonnuclear Energy Research and Development Act of 1974.*

The Office of Energy Related Inventions was established to help the Energy Research and Development Administration evaluate non-nuclear energy ideas.

Public Law 93-577

AN ACT

To establish a national program for research and development in nonnuclear energy sources.

ENERGY-RELATED INVENTIONS

SEC. 14. The National Bureau of Standards shall give particular attention to the evaluation of all promising energy-related inventions, particularly those submitted by individual inventors and small companies for the purpose of obtaining direct grants from the Administrator. The National Bureau of Standards is authorized to promulgate regulations in the furtherance of this section. (88 Stat. 1894)

* * * * *

December 22, 1975, 89 Stat. 871 (Public Law 94-163—94th Congress, 1st session) Energy Policy and Conservation Act.

Public Law 94-163

AN ACT

To increase domestic energy supplies and availability; to restrain energy demand; to prepare for energy emergencies; and for other purposes.

SEC. 323. (a) (2-5) (89 Stat. 919) Test Procedures.... The Administrator shall direct the National Bureau of Standards to develop test procedures for the determination of (A) estimated annual operating costs of covered products of the types specified.....

SEC. 383. (c) (89 Stat. 940) Federal Actions with Respect to Recycled Oil.

As soon as practicable after the date of enactment of this Act, the National Bureau of Standards shall develop test procedures for the determination of substantial equivalency of re-refined or otherwise processed used oil or blend of oil, consisting of such re-refined or otherwise processed used oil and new oil or additives, with new oil for a particular end use. As soon as practicable after development of such test procedures, the National Bureau of Standards shall report such procedures to the Commission.

* * * * *

December 23, 1975, 89 Stat. 1007 (Public Law 94-168—-94th Congress, 1st session) Metric Conversion Act of 1975.

Public Law 94-168

AN ACT

To declare a national policy of coordinating the increasing use of the metric system in the United States, and to establish a United States Metric Board to coordinate the voluntary conversion to the metric system.

SEC. 5. (a) (89 Stat. 1007) There is established , in accordance with this section, an independent instrumentality to be known as a United States Metric Board.

SEC. 6. (7) (C) (89 Stat. 1010) ... consultation by the Secretary of Commerce with the National Conference of Weights and Measures in order to assure that State and local weights and measures officials are (i) appropriately involved in metric conversion activities and (ii) assisted in their efforts to bring about timely amendments to weights and measures laws.

* * * * *

May 11, 1976, 90 Stat. 459 (Public Law 94-282—-94th Congress, 2d session) National Science and Technology Policy, Organization, and Priorities Act of 1976.

Public Law 94-282

AN ACT

To establish a science and technology policy for the United States, to provide for scientific and technological advice and assistance to the President, to provide a comprehensive survey of ways and means for improving the Federal effort in scientific research and information handling, and in the use thereof, to amend the National Science Foundation Act of 1950, and for other purposes.

SEC. 201. (90 Stat. 463) This title may be cited as the "Presidential Science and Technology Advisory Organization of 1976" .

SEC. 202. (90 Stat. 463) There is established in the Executive Office of the President an Office of Science and Technology Policy.

SEC. 205.(b)(1) (90 Stat. 465) The Director [of OSTP] shall establish an Intergovernmental Science, Engineering and Technology Panel, whose purpose shall be to (A) identify and define civilian problems at State, regional, and local levels which science, engineering, and technology may assist in resolving or ameliorating; (B) recommend priorities for addressing such problems; and (C) advise and assist the Director in identifying and fostering policies to facilitate the transfer and utilization of research and development results so as to maximize their application to civilian needs.

SEC. 301. (90 Stat. 468) The President shall establish within the Executive Office of the President a President's Committee on Science and Technology.

SEC. 401.(a) (90 Stat. 471) There is established the Federal Coordinating Council for Science, Engineering and Technology.

SEC. 402. The Federal Council for Science, and Technology established ... March 13, 1959 ... is hereby abolished.

* * * * *

August 14, 1976, 90 Stat. 1125 (Public Law 94-385—-94th Congress, 2d session) Energy Conservation and Production Act.

Public Law 94-385

AN ACT

To amend the Federal Energy Administration Act of 1974 to extend the duration of authorities under such Act; to provide an incentive for domestic production; to provide for electric utility rate design initiatives; to provide for energy conservation standards for new buildings; to provide for energy conservation assistance for existing buildings and industrial plants; and for other purposes.

SEC. 161. (a) (1) (A) (90 Stat.1140) The Administrator shall direct the National Bureau of Standards to develop an energy efficiency improvement target for each type of covered product ...

SEC. 304. (a) (1-2) (90 Stat.1146) [Director of the National Bureau of Standards is to be consulted in the proposed performance standards for new commercial and residential buildings]

SEC. 310. (90 Stat. 1149) The Secretary, in cooperation with the Administrator, the Secretary of Commerce utilizing the services of the Director of the National Bureau of Standards, and the heads of other appropriate Federal agencies, and the National Institute of Building Sciences, shall carry out any activities which the Secretary determines may be necessary or appropriate to assist in the development of performance standards under section 304(a) and to facilitate the implementation of such standards by State and local governments.

SEC. 413. (b) (2) (A) (90 Stat. 1153) The regulations promulgated pursuant to this section shall include provisions prescribing, in coordination with the Secretary of Housing and Urban Development, the Secretary of Health, Education, and Welfare, and the Director of the National Bureau of Standards in the Department of Commerce, for use in various climatic, structural, and human need settings, standards for weatherization materials, energy conservation techniques, and balanced combinations thereof, which are designed to achieve a balance of a healthful dwelling environment and maximum practicable energy conservation.

* * * * *

October 21, 1976, 90 Stat. 2795 (Public Law 94-580—94th Congress, 2d session) Resource Conservation and Recovery Act of 1976.

Public Law 94-580

AN ACT

To provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials and for the safe disposal of discarded materials, and to regulate the management of hazardous waste.

SEC. 5002. (90 Stat. 2820) The Secretary of Commerce, acting through the National Bureau of Standards ... shall ... publish guidelines for the development of specifications for the classification of materials recovered from waste which were destined for disposal.

SEC. 6002. (e) (90 Stat. 2822)....National Bureau of Standards...shall prepare and from time to time revise, guidelines.....

* * * * *

August 7, 1977, 91 Stat. 685 (Public Law 95-95—95th Congress, 1st session)
Clean Air Act Amendments of 1977.

Public Law 95-95

AN ACT

To amend the Clean Air Act, and for other purposes.

SEC. 320. (b) (91 Stat. 782) The [air quality modeling] conference conducted shall provide for participation by.... National Bureau of Standards.

* * * * *

October 7, 1977, 91 Stat. 1098 (Public Law 95-124—95th Congress, 1st session)
Earthquake Hazards Reduction Act of 1977.

Public Law 95-124

AN ACT

To reduce the hazards of earthquakes, and for other purposes.

SEC. 5. (d) (91 Stat. 1101) Participation.— In assigning the role and responsibility of Federal departments, agencies, and entities ... the President shall ... include ... the National Bureau of Standards.

* * * * *

November 9, 1977, 91 Stat. 1290 (Public Law 95-164—95th Congress, 1st session) Federal Mine Safety and Health Amendments Act of 1977.

Public Law 95-164

AN ACT

To promote safety and health in the mining industry, to prevent recurring disasters in the mining industry, and for other purposes.

SEC. 102. (91 Stat. 1295) Advisory Committees . The Secretary of the Interior shall appoint an advisory committee on coal or other mine safety research composed of (B)... the Director of the National Bureau of Standards.

* * * * *

November 4, 1978, 92 Stat. 2513 (Public Law 95-590—95th Congress, 2d session) Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978.

Public Law 95-590

AN ACT

To provide for an accelerated program of research, development, and demonstration of solar photovoltaic energy technologies leading to early competitive commercial applicabilty of such technologies to be carried out by the Department of Energy, with support of the National Aeronautics and Space Administration, the National Bureau of Standards, the General Services Administration, and other federal agencies.

* * * * *

November 9, 1978, 92 Stat. 3206 (Public Law 95-619—95th Congress, 2d session) National Energy Conservation Policy Act.

Public Law 95-619

AN ACT

To improve the energy conservation policy.

SEC. 212. (a) (92 Stat. 3211) Promulgation of Rules by Secretary- The Secretary shall....publish an advanced notice of proposed rulemaking with respect to rules on the content and implementation of residential energy conservation plans...after consultation with...the Secretary of Commerce (acting through the National Bureau of Standards)..., the Secretary shall publish a proposed rule on content and implementation of such plans.

SEC.222. (92 Stat. 3223) Product Standards. The Secretary shall consult with the Secretary of Commerce, acting through the National Bureau of Standards, with regards to any product or material standard which is relied on in implementing this Part as a basis for judging the efficiency, energy efficiency, safety, or other attributes of energy conservation materials, products, or devices...

SEC.545. (a) (92 Stat. 3278). Establishment of Life Cycle Cost Methods. The Secretary in consultation with...the Director of the National Bureau of Standards....shall (1) establish practical and effective methods for estimating and comparing life cycle costs for Federal buildings; and (2) develop and prescribe the procedures to be followed in applying and implementing the methods so established and in conducting preliminary energy audits required by section 547.

SEC.546 . Energy Performance Targets for Federal Buildings. The Secretary, in consultation with....the Director of the National Bureau of Standards....shall establish and publish energy performance targets for Federal buildings, and shall take such actions as may be necessary or appropriate to promote to the maximum extent practicable achievement of such targets by Federal buildings.

* * * * *

July 26, 1979, 93 Stat. 144 (Public Law 96-39—-96th Congress, 1st session)
Trade Agreements Act of 1979.

Public Law 96-39

AN ACT

To approve and implement the trade agreements negotiated under the Trade Act of 1974, and for other purposes.

SEC. 414. (93 Stat. 245) Standards Information Center. (a) Establishment- The Secretary of Commerce shall maintain within the Department of Commerce a standards information center. (b) Functions.-The

standards information center shall-(1) serve as the central national collection facility for information relating to standards, certification systems, and standards-related activities, whether such standards, systems, or activities are public or private, domestic or foreign, or international, regional, national, or local; (2) make available to the public at such reasonable fee as the Secretary shall prescribe, copies of information required to be collected under paragraph (1) other than information to which paragraph (3) applies; (3) use its best efforts to make available to the public, at such reasonable fees as the Secretary shall prescribe, copies of information required to be collected under paragraph (1) that is of private origin, on a cooperative basis with the private individual or entity, foreign or domestic, who holds the copyright on the information; (4) in case of such information that is of foreign origin, provide, at such reasonable fee as the Secretary shall prescribe, such translation services as may be necessary; (5) serve as the inquiry point for requests for information regarding standards-related activities, whether adopted or proposed, within the United States, except that in carrying out this paragraph, the Secretary of Commerce shall refer all inquiries regarding agricultural products to the technical office established under section 412(a)(2) within the Department of Agriculture; and (6) provide such other services as may be appropriate, including but not limited to, such services to the technical offices established under section 412 as may be requested by those offices carrying out their functions.

* * * * *

November 16, 1979, 93 Stat. 863 (Public Law 96-121—96th Congress, 1st session) Authorization, Appropriations-Federal Fire Prevention and Control Act of 1974.

Public Law 96-121

AN ACT

To authorize appropriations for the Federal Fire Prevention and Control Act of 1974, and for other purposes.

SEC. 3. (93 Stat. 863) Section 16(b) of the Act entitled "An Act to establish the National Bureau of Standards", approved March 3, 1901 (15 U.S.C. 278f(b)), is amended to read as follows: "(b) Authorization of Appropriations.-For purposes of this section, there are authorized to be appropriated an amount not to exceed $5,650,000 for the fiscal year ending September 30, 1980, which amount includes-"(l) $525,000 for programs which are recommended in the report submitted to the Congress by the Administrator of the United States Fire Administration pursuant to section 24(b)(1) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2220(b)(1); and "(2) $119,000 for adjustments required by law in salaries, pay, retirement, and employee benefits."

* * * * *

January 8, 1980, 93 Stat. 1339 (Public Law 96-187—96th Congress, 1st session) Federal Election Campaign Act Amendments of 1979.

Public Law 96-187

AN ACT

To amend the Federal Election Campaign Act of 1971 to make certain changes in the reporting and disclosure requirements of such act, and for other purposes.

SEC. 302. (93 Stat. 1368) Voting System Study. The Federal Election Commission, with the cooperation and assistance of the National Bureau of Standards, shall conduct a preliminary study with respect to the future development of voluntary engineering and procedural performance standards for voting systems used in the United States.

* * * * *

October 15, 1980, 94 Stat. 2049 (Public Law 96-461—96th Congress, 2d session) National Bureau of Standards Authorization Act for Fiscal Years 1981 and 1982.

Public Law 96-461

AN ACT

To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal years 1981 and 1982, and for other purposes.

SEC. 2. (a) (94 Stat. 2049) There are hereby authorized to be appropriated to the Secretary of Commerce, hereinafter referred to as the Secretary, to carry out activities performed by the National Bureau of Standards.

SEC. 8 . (94 Stat. 2051) Facilities Improvement. Section 14 of the Act of March 3, 1901..is further amended....

SEC. 9. (94 Stat. 2051) International Activities. In order to develop and strengthen the expertise of the National Bureau of Standards in science and engineering, to enhance the Secretary's ability to maintain the Bureau's programs at the forefront of worldwide developments in science and engineering, and to cooperate in international scientific activities, the Act of March 3, 1901 (15 U.S.C. 271-278h), as amended, is further amended by inserting immediately after section 16 the following new section: "Sec. 17. (a) The Secretary is authorized, notwithstanding any other provision of law, to expend such sums, within the limit of appropriated funds, as the Secretary may deem desirable, through the grant of fellowships or any other form of financial assistance, to defray the expenses of foreign nationals not in service to the Government of the United States while they are performing scientific or engineering work at the National Bureau of Standards or participating in the exchange of scientific or technical information at the National Bureau of Standards. "(b) The Congress consents to the acceptance by employees of the National Bureau of Standards of fellowships, lectureships, or other positions for the performance of scientific or engineering activities or for the exchange of scientific or technical information, offered by a foreign government, and to the acceptance and retention by an employee of the National Bureau of Standards of any form of financial or other assistance provided by a foreign government as compensation for or as a means of defraying expenses associated with the performance of scientific or engineering activities or the exchange of scientific or technical information, in any case where the acceptance of such fellowship, lectureship, or position or the acceptance and retention of such assistance is determined by the Secretary to be appropriate and consistent with the interests of the United States. For the purposes of this subsection, the definitions appearing in section 7342(a) of title 5 of the United States code apply. Civil actions may be brought and penalties assessed against any employee who knowingly accepts and retains assistance from a foreign government not consented to by this subsection in the same manner as is prescribed by section 7342(h) of title 5 of the United States Code. "(c) Provisions of law prohibiting the use of any part of any appropriation for the payment of compensation to any employee or officer of the Government of the United States who is not a citizen of the United States shall not apply to the payment of compensation to scientific or engineering personnel of the National Bureau of Standards."

* * * * *

October 15, 1980, 94 Stat. 2055 (Public Law 96-463—96th Congress, 2d session) Used Oil Recycling Act of 1980.

Public Law 96-463

AN ACT

To amend the Solid Waste Disposal Act to further encourage the use of recycled oil.

SEC. 9. (94 Stat. 2058) Study. The Administrator of the Environmental Protection Agency, in cooperation with the Secretary of Energy, the Federal Trade Commission, and the Secretary of Commerce, shall conduct a study (1) assessing environmental problems associated with improper disposal or reuse of used oil...

* * * * *

October 19, 1980, 94 Stat. 2257 (Public Law 96-472—-96th Congress, 2d session) Earthquake Hazards Reduction and Fire Prevention and Control Program.

Public Law 96-472

AN ACT

To amend the Earthquake Hazards Reduction Act of 1977 and the Federal Fire Prevention and Control Act of 1974 to authorize the appropriation of funds to the Director of the Federal Emergency Management Agency to carry out the earthquake hazards reduction program and the fire prevention and control program and for other purposes.

SEC. 6. (d) (94 Stat. 2259) National Bureau of Standards- To enable the Bureau to carry out responsibilities that may be assigned to it under this Act, there are authorized to be appropriated $425,000 for the fiscal year ending September 30, 1981.

Sec. 201 (c) (3) (94 Stat. 2260) not less than $4,255,000 for research and development for the activities under section 18 of this Act at the Fire Research Center of the National Bureau of Standards....

* * * * *

October 21, 1980, 94 Stat. 2311 (Public Law 96-480—-96th Congress, 2d session) Stevenson-Wydler Technology Innovation Act of 1980.

Public Law 96-480

AN ACT

To promote United States technological innovation for the achievement of national economic, environmental, and social goals, and for other purposes. Promotes U.S. technological innovation for the achievement of national economic, environmental, and social goals. Requires Secretary of Commerce to establish and maintain an Office of Industrial Technology and establishes National Technology Medal.

SEC. 6. (a) (94 Stat. 2313) Establishment.—The Secretary shall provide assistance for the establishment of Centers for Industrial Technology. Such Centers shall be affiliated with any university, or other nonprofit institution, or group thereof, that applies for and is awarded a grant or enters into a cooperative agreement under this section.

SEC. 11. (b) (94 Stat. 2318) Establishment of Research and Technology Applications Offices.—-Each Federal laboratory shall establish an Office of Research and Technology Applications.

SEC. 12. (a) (94 Stat. 2319) Establishment.—-There is hereby established a National Technology Medal.....

* * * * *

November 20, 1981, 95 Stat. 1081 (Public Law 97-80—-97th Congress, 1st session) Authorization, Appropriations-Earthquake Hazards Reduction and Fire Prevention and Control Program.

Public Law 97-80

AN ACT

To amend the Earthquake Hazards Reduction Act of 1977 and the Federal Fire Prevention and Control Act of 1974 to authorize the appropriation of funds to the Director of the Federal Emergency Management Agency to carry out the earthquake hazards reduction programs and the fire prevention and control program, and for other purposes.

SEC. 201 (95 Stat. 1081-82) Section 17 of the Federal Fire Prevention and Control Act of 1974 is amended by adding at the end thereof the following: "(d) Except as otherwise specifically provided with respect to the

payment of claims under section 11 of this Act, to carry out the purposes of this Act, there are authorized to be appropriated-"(l) $20,815,000 for the fiscal year ending September 30, 1982, and $23,312,800 for the fiscal year ending September 30, 1983, which amount shall include-"(A) such sums as may be necessary for the support of research and development at the Fire Research Center of the National Bureau of Standards under section 18 of this Act, which sums shall be in addition to those funds authorized to be appropriated under the National Bureau of Standards Authorization Act for fiscal years 1981 and 1982; ...

* * * * *

October 6, 1982, 96 Stat. 1222 (Public Law 97-286—97th Congress, 2d session) National Bureau of Standards Authorization Act for Fiscal Year 1983.

Public Law 97-286

AN ACT

To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal year 1983, and for other purposes.

SEC. 2 (a) (96 Stat. 1222) There are hereby authorized to be appropriated to the Secretary of Commerce, hereinafter referred to as the Secretary, to carry out activities performed by the National Bureau of Standards, the sums set forth in the following line items: (1) Measurement Research and Standards, for fiscal year 1983, $50,389,000. (2) Engineering Measurements and Standards, for fiscal year 1983, $20,807,000. (3) Computer Science and Technology, for fiscal year 1983, $10,000,000. (4) Core Research Program for Innovation and Productivity, for fiscal year 1983, $11,188,000. (5) Technical Competence Fund, for fiscal year 1983, $6,986,000. (6) Fire Research Center, for fiscal year 1983, $4,991,000. (7) Central Technical Support, for fiscal year 1983, $13,500,000. (b) Notwithstanding any other provision of this or any other Act, for fiscal year 1983: (1) of the total amount authorized under subsection (a)(4) not less than $3,000,000 shall be available for "Metals Processing"; (2) of the total amounts authorized under subsections (a)(1) and (a)(2), not less than $1,000,000 shall be available for "Measurement Standards for the Handicapped"; (3) of the total amount authorized under subsection (a)(3), not less than $10,000,000 shall be available for "Computer Science and Technology"; and (4) of the total amount authorized under subsection (a)(4), $3,200,000 for "Robotics Research and Development".

SEC. 3. (96 Stat. 1222) In addition to the sums authorized in section 2, not more than $500,000 is authorized for fiscal year 1983 for expenses of the National Bureau of Standards incurred outside the United States, to be paid for in foreign currencies that the Secretary of the Treasury determines to be excess to the normal requirements of the United States.

SEC. 8. (96 Stat. 1223) The Secretary of Commerce shall charge for any service performed by the Bureau, at the request of another Government agency....

* * * * *

January 6, 1983, 96 Stat. 2097 (Public Law 97-424—97th Congress, 2d session) Surface Transportation Assistance Act of 1982.

Public Law 97-424

AN ACT

To authorize appropriations for construction of certain highways in accordance with title 23, United States Code, for highway safety, for mass transportation in urban and rural areas, and for other purposes.

SEC. 110. (c)(1) (96 Stat. 2105) The Secretary of Transportation is directed to coordinate a study with the National Bureau of Standards, the American Society for Testing and Materials and other organizations as deemed appropriate, to determine existing quality of design, need for uniform standards and costs for highway systems and bridges.

* * * * *

July 16, 1984, 98 Stat. 431 (Public Law 98-362—-98th Congress, 2d session)
Small Business Computer Security and Education Act of 1984.

Public Law 98-362

AN ACT

To amend the Small Business Act to establish a small business computer security and education advisory council, and for other purposes.

SEC. 3. (B) (98 Stat. 432) The advisory council shall consist of the following members:... (ii) an official of the Institute for Computer Sciences and Technology of the Department of Commerce, appointed by the Secretary of Commerce.

* * * * *

October 30, 1984, 98 Stat. 2925 (Public Law 98-567—-98th Congress, 2d session) Cigarette Safety Act of 1984.

Public Law 98-567

AN ACT

To establish an interagency committee and a technical study group on cigarette safety.

SEC.3. (a) (1) . (98 Stat. 2925) ... one scientific or technical representative each from...the Center for Fire Research of the National Bureau of Standards...

* * * * *

July 29, 1985, 99 Stat. 171 (Public Law 99-73—-99th Congress, 1st session)
National Bureau of Standards Authorization Act for Fiscal Year 1986.

Public Law 99-7

AN ACT

To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal year 1986, and for other purposes.

SEC. 2. (a) (99 Stat. 171) Authorizations for Program Activities. There are authorized to be appropriated to the Secretary of Commerce for fiscal year 1986, to carry out activities performed by the National Bureau of Standards, the sums set forth in the following line items: (1) Measurement Research and Standards, $36,843,000. (2) Materials Science and Engineering, $21,943,000. (3) Engineering Measurements and Standards, $33,555,000. (4) Computer Science and Technology, $9,657,000. (5) Center for Fire Research, $5,827,000. (6) Technical Competence Fund, $8,481,000. (7) Central Technical Support, $8,179,000.

(b) Notwithstanding any other provision of this or any other Act for fiscal year 1986- (1) ...$2,000,000 is authorized only for steel technology; (2)....$3,895,000 is authorized only for the Center for Building Technology, and $50,000 is authorized only for the purpose of assisting the creation and maintenance of data bases on structural failures; and (3)...$2,575,00 is authorized for transfer to the Working Capital Fund....(d) The National Bureau of Standards shall seek reimbursements of not less than $500,000 from other Federal agencies to expand its efforts in support of basic scientific research on the atmospheric, climatic, and environmental consequences of nuclear explosions and nuclear exchanges.

SEC. 7. (99 Stat. 173) Structural Failures. The National Bureau of Standards, on its own initiative but only after consultation with local authorities, may initiate and conduct investigations to determine the causes of structural failures in structures which are used or occupied by the general public.

* * * * *

October 20, 1986, 100 Stat. 1785 (Public Law 99-502—99th Congress, 2d session) Federal Technology Transfer Act of 1986.

Public Law 99-502

AN ACT

To amend the Stevenson-Wydler Technology Innovation Act of 1980 to promote technology transfer by authorizing Government-operated laboratories to enter into cooperative research agreements and by establishing a Federal Laboratory Consortium for Technology Transfer within the National Bureau of Standards, and for other purposes.

SEC. 3. (e) (1) (100 Stat. 1787) Establishment of Federal Laboratory Consortium for Technology Transfer— There is hereby established the Federal Laboratory Consortium for Technology Transfer.

SEC. 3. (e) (4) (100 Stat. 1788) The Director of the National Bureau of Standards shall provide the Consortium, on a reimbursable basis, with administrative services, such as office space, personnel, and support services of the Bureau, as requested by the Consortium and approved by such Director.

* * * * *

October 22, 1986, 100 Stat. 2970 (Public Law 99-519—99th Congress, 1st session) Asbestos Hazard Emergency Response Act of 1986.

Public Law 99-519

AN ACT

To amend the Toxic Substances Control Act to require the Environmental Protection Agency to promulgate regulations requiring inspection for asbestos-containing materials in the Nation's schools, development of asbestos management plans for such schools, response actions with respect to friable asbestos-containing material in such schools, and for other purposes.

SEC. 206. (d)(2) (100 Stat. 2982) The National Bureau of Standards...shall...develop an accreditation program for laboratories which conduct qualitative and semi-quantitative analysis of bulk samples of asbestos-containing material, and develop an accreditation program for laboratories which conduct analysis of air samples of asbestos from school buildings under the authority of a local educational agency.

* * * * *

October 28, 1986, 100 Stat. 3236 (Public Law 99-574—99th Congress, 2d session) National Bureau of Standards Authorization Act for Fiscal Year 1987.

Public Law 99-574

AN ACT

To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal year 1987, and for other purposes.

SEC. 2 (a) (100 Stat. 3236) There are authorized to be appropriated to the Secretary of Commerce for fiscal year 1987, to carry out the activities performed by the National Bureau of Standards, the sums set forth in the following line items: (1) Measurement Research and Standards, $36,582,000; (2) Materials Science and Engineering, $21,228,000; (3) Engineering Measurements and Standards, $35,875,000; (4) Computer Science and Technology, $7,500,00; and (5) Research Support Activities, $22,768,000.

(b)(1)...$1,900,000 is authorized only for steel technology; (2)...$3,470,000 is authorized only for the Center for Building Technology and $5,402,000 is authorized only for the Center for Fire Research; (3)...$1,000,000 is authorized only for Computer Security Activities; (4)...$6,763,000 is authorized only for the Technical Competence Fund; and (5)..$6,500,000 is authorized only for the design, equipment, and construction of the Cold Neutron Research Facility.

SEC. 6. (a) (100 Stat. 3237) Financial Assistance to Current and Prospective Employees....."Sec. 18. The Director is authorized to expend up to 1 per centum of the funds appropriated for activities of the National Bureau of Standards in any fiscal year, as the Director may deem desirable, for awards of research fellowships and other forms of financial assistance to students at institutions of higher learning within the United States who show promise as present or future contributors to the mission of the Bureau....

SEC. 7. (100 Stat. 3237) Assessment of Emerging Technologies Requiring Research in Metrology. The Board of Assessment of the National Bureau of Standards programs shall include, as part of its annual review, an assessment of emerging technologies which are expected to require research in metrology to keep the Bureau abreast of its mission....

SEC. 8. (a) (100 Stat. 3238) Post-Doctoral Fellowship Program...."Sec. 19. The National Bureau of Standards, in conjunction with the National Academy of Sciences, shall establish and conduct a post-doctoral fellowship program...

SEC. 9. (a) (100 Stat. 3238) Process and Quality Control and Calibration Programs. The Director of the National Bureau of Standards shall hold discussions with representatives of Federal agencies....which use the process and quality control and calibration programs of the Bureau, and with ...private sector, in order to determine the extent of the demand for research and services under such programs...

SEC.10. (a)(1) (100 Stat. 3238) Demonstration Project Relating to Personnel Management. The Office of Personnel Management and the National Bureau of Standards shall jointly design a demonstration project which shall be conducted by the Director of the National Bureau of Standards.

* * * * *

November 17, 1986, 100 Stat. 4082 (Public Law 99-662—99th Congress, 2d session) Water Resources Development Act of 1986.

Public Law 99-662

AN ACT

To provide for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

SEC. 1201. (b) (100 Stat. 4262) The Secretary, in cooperation with the National Bureau of Standards, shall undertake a program of research in order to develop improved techniques and equipment for rapid and effective dam inspection, together with devices for the continued monitoring of dams for safety purposes.

* * * * *

March 17, 1987, 101 Stat. 103 (Public Law 100-12—100th Congress, 1st session) National Appliance Energy Conservation Act of 1987.

Public Law 100-12

AN ACT

To amend the Energy Policy and Conservation Act with respect to energy conservation standards for appliances.

SEC. 323(C) (101 Stat. 106) The Secretary shall direct the National Bureau of Standards to assist in developing new or amended test procedures.

* * * * *

August 20, 1987, 101 Stat. 724 (Public Law 100-107—100th Congress, 1st session) Malcolm Baldrige National Quality Improvement Act of 1987.

Public Law 100-107

AN ACT

To amend the Stevenson-Wydler Technology Innovation Act of 1980 to establish the Malcolm Baldrige National Quality Award, with the objective of encouraging American business and other organizations to practice effective quality control in the provision of their goods and services.

SEC. 2. (b) (101 Stat. 725) Purpose.—It is the purpose of this Act to provide for the establishment and conduct of a national quality improvement program under which (1) awards are given to selected companies and other organizations in the United States that practice effective quality management and as a result make significant improvements in the quality of their goods and services, and (2) information is disseminated about the successful strategies and programs.

SEC. 3. (101 Stat. 726) Establishment of the Malcolm Baldrige National Quality Award Program...."Sec. 16. (d) Criteria for Qualification.-(1) An organization may qualify for an award under this section only if it-"(A) applied to the Director of the National Bureau of Standards in writing, for the award....

* * * * *

January 8, 1988, 101 Stat. 1724 (Public Law 100-235—100th Congress, 1st session) Computer Security Act of 1987.

Public Law 100-235

AN ACT

To provide for a computer standards program within the National Bureau of Standards, to provide for Government-wide computer security, and to provide for the training in security matters of persons who are involved in the management, operation, and use of Federal computer systems, and for other purposes.

SEC. 3. (101 Stat. 1724-1725) Establishment of Computer Standards Program. The Act of March 3, 1901 is amended....by inserting...the following new sections: "Sec. 20. (a) The National Bureau of Standards shall—-(1) have the mission of developing standards, guidelines, and associated methods and techniques for computer systems; (2) except as described in paragraph (3) of this subsection (relating to security standards), develop uniform standards and guidelines for Federal computer systems....(3) have responsibility within the Federal Government for developing technical, management, physical, and administrative standards and guidelines for the cost-effective security and privacy of sensitive information in Federal computer systems...(4) submit standards and guidelines developed pursuant to...this subsection...to the Secretary of Commerce for promulgation under...the Federal Property and Administrative Services Act of 1949; (5) develop guidelines for use by operators of Federal computer systems that contain sensitive information in training their employees in security awareness and accepted security practice...(6) develop validation procedures for, and evaluate the effectiveness of, standards and guidelines developed pursuant to....this subsection through research and liaison with other government and private agencies. (b) In fulfilling subsection (a) of this section, the National Bureau of Standards is authorized—(1) to assist the private sector, upon request, in using and applying the results of the programs and activities under this section; (2) to make recommendations, as appropriate, to the Administrator of General Services on policies and regulations proposed pursuant to section 111(d) of the Federal Property and Administrative Services Act of 1949; (3) as requested, to provide to operators of Federal computer systems technical assistance in implementing the standards and guidelines promulgated pursuant to section 111(d) of the Federal Property and Administrative Act of 1949; (4) to assist, as appropriate, the Office of Personnel Management in developing regulations pertaining to training, as required by section 5 of the Computer Security Act of 1987; (5) to perform research and to conduct studies, as needed, to determine the nature and extent of the vulnerabilities of, and to devise techniques for the cost-effective security and privacy of sensitive information in Federal computer systems; and (6) to coordinate closely with other agencies and offices....

"SEC. 21. (a) (101 Stat. 1727) There is hereby established a Computer System Security and Privacy Advisory Board within the Department of Commerce.

SEC.4. (101 Stat. 1728) Amendment to Brooks Act. Section 111(d) of the Federal Property and Administrative Services Act of 1949 is amended to read as follows: "(d)(1) The Secretary of Commerce shall, on the basis of standards and guidelines developed by the National Bureau of Standards pursuant to section 20(a) (2) and (3) of the National Bureau of Standards Act, promulgate standards and guidelines pertaining to Federal computer systems, making such standards compulsory and binding to the extent to which the Secretary determines necessary to improve the efficiency of operation or security and privacy of Federal computer systems.....

* * * * *

August 23, 1988, 102 Stat. 1107 (Public Law 100-418—100th Congress, 2d session) Omnibus Trade and Competitiveness Act of 1988.

Public Law 100-418

AN ACT

To enhance the competitiveness of American industry, and for other purposes.

SUBTITLE B—TECHNOLOGY

PART I—TECHNOLOGY COMPETITIVENESS

SEC. 5101. *15 USC 271 note* SHORT TITLE.

This part may be cited as the "Technology Competitiveness Act".

SUBPART A—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

SEC.. 5111. FINDINGS AND PURPOSES.

Section 1 of the Act of March 3, 1901 (15 U.S.C. 271) is amended to read as follows:

"FINDINGS AND PURPOSES

"SECTION 1. (a) The Congress finds and declares the following:

"(1) The future well-being of the United States economy depends on a strong manufacturing base and requires continual improvements in manufacturing technology, quality control, and techniques for ensuring product reliability and cost-effectiveness.

"(2) Precise measurements, calibrations, and standards help United States industry and manufacturing concerns compete strongly in world markets.

"(3) Improvements in manufacturing and product technology depend on fundamental scientific and engineering research to develop (A) the precise and accurate measurement methods and measurement standards needed to improve quality and reliability, and (B) new technological processes by which such improved methods may be used in practice to improve manufacturing and to assist industry to transfer important laboratory discoveries into commercial products.

"(4) Scientific progress, public safety, and product compatibility and standardization also depend on the development of precise measurement methods, standards, and related basic technologies.

"(5) The National Bureau of Standards since its establishment has served as the Federal focal point in developing basic measurement standards and related technologies, has taken a lead role in stimulating cooperative work among private industrial organizations in efforts to surmount technological hurdles, and otherwise has been responsible for assisting in the improvement of industrial technology.

"(6) The Federal Government should maintain a national science, engineering, and technology laboratory which provides measurement methods, standards, and associated technologies and which aids United States companies in using new technologies to improve products and manufacturing processes.

"(7) Such national laboratory also should serve industry, trade associations, State technology programs, labor organizations, professional societies, and educational institutions by disseminating information on new basic technologies including automated manufacturing processes.

"(b) It is the purpose of this Act—

"(1) to rename the National Bureau of Standards as the National Institute of Standards and Technology and to modernize and restructure that agency to augment its unique ability to enhance the competitiveness of American industry while maintaining its traditional function as lead national laboratory for providing the measurements, calibrations, and quality assurance techniques which underpin United States commerce, technological progress, improved product reliability and manufacturing processes, and public safety;

"(2) to assist private sector initiatives to capitalize on advanced technology;

"(3) to advance, through cooperative efforts among industries, universities, and government laboratories, promising research and development projects, which can be optimized by the private sector for commercial and industrial applications; and

"(4) to promote shared risks, accelerated development, and pooling of skills which will be necessary to strengthen America's manufacturing industries."

SEC. 5112. ESTABLISHMENT, FUNCTIONS, AND ACTIVITIES.

(a) ESTABLISHMENT, FUNCTIONS, AND ACTIVITIES OF THE INSTITUTE.—Section 2 of the Act of March 3, 1901 (15 U.S.C. 272) is amended to read as follows:

"ESTABLISHMENT, FUNCTIONS, AND ACTIVITIES

"SEC. 2.

(a) There is established within the Department of Commerce a science, engineering, technology, and measurement laboratory to be known as the National Institute of Standards and Technology (hereafter in this Act referred to as the 'Institute').

"(b) The Secretary of Commerce (hereafter in this Act referred to as the 'Secretary') acting through the Director of the Institute (hereafter in this Act referred to as the 'Director') and, if appropriate, through other officials, is authorized to take all actions necessary and appropriate to accomplish the purposes of this Act, including the following functions of the Institute—

"(1) to assist industry in the development of technology and procedures needed to improve quality, to modernize manufacturing processes, to ensure product reliability, manufacturability, functionality, and cost-effectiveness, and to facilitate the more rapid commercialization, especially by small and medium-sized companies throughout the United States, of products based on new scientific discoveries in fields such as automation, electronics, advanced materials, biotechnology, and optical technologies;

"(2) to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods for making measurements consistent with those standards, including comparing standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal Government;

"(3) to enter into contracts, including cooperative research and development arrangements, in furtherance of the purposes of this Act;

"(4) to provide United States industry, Government, and educational institutions with a national clearinghouse of current information, techniques, and advice for the achievement of higher quality and productivity based on current domestic and international scientific and technical development;

"(5) to assist industry in the development of measurements, measurement methods, and basic measurement technology;

"(6) to determine, compile, evaluate, and disseminate physical constants and the properties and performance of conventional and advanced materials when they are important to science, engineering, manufacturing, education, commerce, and industry and are not available with sufficient accuracy elsewhere;

"(7) to develop a fundamental basis and methods for testing materials, mechanisms, structures, equipment, and systems, including those used by the Federal Government;

"(8) to assure the compatibility of United States national measurement standards with those of other nations;

"(9) to cooperate with other departments and agencies of the Federal Government, with industry, with State and local governments, with the governments of other nations and international organizations, and with private organizations in establishing standard practices, codes, specifications, and voluntary consensus standards;

"(10) to advise government and industry on scientific and technical problems; and

"(11) to invent, develop, and (when appropriate) promote transfer to the private sector of measurement devices to serve special national needs.

"(c) In carrying out the functions specified in subsection (b), the Secretary, acting through the Director and, if appropriate, through other appropriate officials, may, among other things—

"(1) construct physical standards;

"(2) test, calibrate, and certify standards and standard measuring apparatus;

"(3) study and improve instruments, measurement methods, and industrial process control and quality assurance techniques;

"(4) cooperate with the States in securing uniformity in weights and measures laws and methods of inspection;

"(5) cooperate with foreign scientific and technical institutions to understand technological developments in other countries better;

"(6) prepare, certify, and sell standard reference materials for use in ensuring the accuracy of chemical analyses and measurements of physical and other properties of materials;

"(7) in furtherance of the purposes of this Act, accept research associates, cash donations, and donated equipment from industry, and also engage with industry in research to develop new basic and generic technologies for traditional and new products and for improved production and manufacturing;

"(8) study and develop fundamental scientific understanding and improved measurement, analysis, synthesis, processing, and fabrication methods for chemical substances and compounds, ferrous and nonferrous metals, and all traditional and advanced materials, including processes of degradation;

"(9) investigate ionizing and nonionizing radiation and radioactive substances, their uses, and ways to protect people, structures, and equipment from their harmful effects;

"(10) determine the atomic and molecular structure of matter, through analysis of spectra and other methods, to provide a basis for predicting chemical and physical structures and reactions and for designing new materials and chemical substances, including biologically active macromolecules;

"(11) perform research on electromagnetic waves, including optical waves, and on properties and performance of electrical, electronic, and electromagnetic devices and systems and their essential materials, develop and maintain related standards, and disseminate standard signals through broadcast and other means;

"(12) develop and test standard interfaces, communication protocols, and data structures for computer and related telecommunications systems;

"(13) study computer systems (as that term is defined in section 20(d) of this Act) and their use to control machinery and processes;

"(14) perform research to develop standards and test methods to advance the effective use of computers and related systems and to protect the information stored, processed, and transmitted by such systems and to provide advice in support of policies affecting Federal computer and related telecommunications systems;

"(15) determine properties of building materials and structural elements, and encourage their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

"(16) undertake such research in engineering, pure and applied mathematics, statistics, computer science, materials science, and the physical sciences as may be necessary to carry out and support the functions specified in this section;

"(17) compile, evaluate, publish, and otherwise disseminate general, specific and technical data resulting from the performance of the functions specified in this section or from other sources when such data are important to science, engineering, or industry, or to the general public, and are not available elsewhere;

"(18) collect, create, analyze, and maintain specimens of scientific value;

"(19) operate national user facilities;

"(20) evaluate promising inventions and other novel technical concepts submitted by inventors and small companies and work with other Federal agencies, States, and localities to provide appropriate technical assistance and support for those inventions which are found in the evaluation process to have commercial promise;

"(21) demonstrate the results of the Institute's activities by exhibits or other methods of technology transfer, including the use of scientific or technical personnel of the Institute for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties; and

"(22) undertake such other activities similar to those specified in this subsection as the Director determines appropriate."

(b) OTHER FUNCTIONS OF SECRETARY. —The Secretary of Commerce is authorized to—

(1) conduct research on all of the telecommunications sciences, including wave propagation and reception, the conditions which affect electromagnetic wave propagation and reception, electromagnetic noise and interference, radio system characteristics, operating techniques affecting the use of the electromagnetic spectrum, and methods for improving the use of the electromagnetic spectrum for telecommunications purposes;

(2) prepare and issue predictions of electromagnetic wave propagation conditions and warnings of disturbances in such conditions;

(3) investigate conditions which affect the transmission of radio waves from their source to a receiver and the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operations;

(4) conduct research and analysis in the general field of telecommunications sciences in support of assigned functions and in support of other Government agencies;

(5) investigate nonionizing electromagnetic radiation and its uses, as well as methods and procedures for measuring and assessing electromagnetic environments, for the purpose of developing and coordinating policies and procedures affecting Federal Government use of the electromagnetic spectrum for telecommunications purposes;

(6) compile, evaluate, publish, and otherwise disseminate general scientific and technical data resulting from the performance of the functions specified in this section or from other sources when such data are important to science, engineering, or industry, or to the general public, and are not available elsewhere; and

(7) undertake such other activities similar to those specified in this subsection as the Secretary of Commerce determines appropriate.

(c) DIRECTOR OF INSTITUTE. —(1) Section 5 of the Act of March 3, 1901 (15 U.S.C. 274) is amended to read as follows:

"SEC. 5. The Director shall be appointed by the President, by and with the advice and consent of the Senate. The Director shall have the general supervision of the Institute, its equipment, and the exercise of its functions. The Director shall make an annual report to the Secretary of Commerce. The Director may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the exercise of the functions of the Institute. The Director shall be compensated at the rate in effect for level IV of the Executive Schedule under section 5315 of title 5, United States Code. Until such time as the Director assumes office under this section, the most recent Director of the National Bureau of Standards shall serve as Director.".

(2) Section 5315 of title 5, United States Code, is amended by striking "National Bureau of Standards" and inserting in lieu thereof "National Institute of Standards and Technology".

(d) ORGANIZATION PLAN. —(1) At least 60 days before its effective date and within 120 days after the date of the enactment of this Act, an initial organization plan for the National Institute of Standards and Technology (hereafter in this part referred to as the "Institute") shall be submitted by the Director of the Institute (hereafter in this part referred to as the "Director") after consultation with the Visiting Committee on Advanced Technology, to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate. Such plan shall—

(A) establish the major operating units of the Institute;

(B) assign each of the activities listed in section 2(c) of the Act of March 3, 1901, and all other functions and activities of the Institute, to at least one of the major operating units established under subparagraph (A);

(C) provide details of a 2-year program for the Institute, including the Advanced Technology Program;

(D) provide details regarding how the Institute will expand and fund the Inventions program in accordance with section 27 of the Act of March 3, 1901; and

(E) make no changes in the Center for Building Technology or the Center for Fire Research.

(2) The Director may revise the organization plan. Any revision of the organization plan submitted under paragraph (1) shall be submitted to the appropriate committees of the House of Representatives and the Senate at least 60 days before the effective date of such revision.

(3) Until the effective date of the organization plan, the major operating units of the Institute shall be the major operating units of the National Bureau of Standards that were in existence on the date of the enactment of this Act and the Advanced Technology Program.

SEC. 5113. REPEAL OF PROVISIONS.

The second paragraph of the material relating to the Bureau of Standards in the first section of the Act of July 16, 1914 (15 U.S.C. 280), the last paragraph of the material relating to Contingent and Miscellaneous Expenses in the first section of the Act of March 4, 1913 (15 U.S.C. 281), and the first section of the Act of May 14, 1930 (15 U.S.C. 282) are repealed.

SEC. 5114. REPORTS TO CONGRESS; STUDIES BY THE NATIONAL ACADEMIES OF ENGINEERING AND SCIENCES.

The Act of March 3, 1901 (15 U.S.C. 271 et seq.) is amended—

(1) by redesignating section 23 as section 31; and

(2) by adding after section 22 the following new sections:

"REPORTS TO CONGRESS

"SEC. 23.

"(a) The Director shall keep the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives fully and currently informed with regard to all of the activities of the Institute.

"(b) The Director shall justify in writing all changes in policies regarding fees for standard reference materials and calibration services occurring after June 30, 1987, including a description of the anticipated impact of any proposed changes on demand for and anticipated revenues from the materials and services. Changes in policy and fees shall not be effective unless and until the Director has submitted the proposed schedule and justification to the Congress and 30 days on which both Houses of Congress are in session have elapsed since such submission, except that the requirement of this sentence shall not apply with respect to adjustments which are based solely on changes in the costs of raw materials or of producing and delivering standard reference materials or calibration services.

"STUDIES BY THE NATIONAL RESEARCH COUNCIL

"SEC. 24. The Director may periodically contract with the National Research Council for advice and studies to assist the Institute to serve United States industry and science. The subjects of such advice and studies may include—

"(1) the competitive position of the United States in key areas of manufacturing and emerging technologies and research activities which would enhance that competitiveness;

"(2) potential activities of the Institute, in cooperation with industry and the States, to assist in the transfer and dissemination of new technologies for manufacturing and quality assurance; and

"(3) identification and assessment of likely barriers to widespread use of advanced manufacturing technology by the United States workforce, including training and other initiatives which could lead to a higher percentage of manufacturing jobs of United States companies being located within the borders of our country."

"SEC. 5115. TECHNICAL AMENDMENTS.

(a) AMENDMENTS TO ORGANIC ACT. —

(1) Except as provided in paragraph (2), the Act of March 3, 1901 (15 U.S.C. 271 et seq.) is amended by striking "National Bureau of Standards", "Bureau" and "bureau" wherever they appear and inserting in lieu thereof "Institute".

(2) Section 31 of such Act, as so redesignated by section 5114(1) of this part, is amended by striking "National Bureau of Standards" and inserting in lieu thereof "National Institute of Standards and Technology".

(b) AMENDMENTS TO STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980. —(1) Section 8(b) of the Stevenson-Wydler Technology Innovation Act of 1980, as so redesignated by section 5122 of this part, is amended by striking "Director" and inserting in lieu thereof "Assistant Secretary".

(2) Sections 11(e) and 17(d) and (e) of the Stevenson-Wydler Technology Innovation Act of 1980, as so redesignated by section 5122(a)(1) of this part, are amended—

(A) by striking "National Bureau of Standards" wherever it appears and inserting in lieu thereof "National Institute of Standards and Technology"; and

(B) by striking "Bureau" wherever it appears and inserting in lieu thereof "Institute".

(c) AMENDMENTS TO OTHER LAWS. —References in any other Federal law to the National Bureau of Standards shall be deemed to refer to the National Institute of Standards and Technology

SUBPART B—TECHNOLOGY EXTENSION ACTIVITIES AND CLEARINGHOUSE ON STATE AND LOCAL INITIATIVES

SEC. 5121. TECHNOLOGY EXTENSION ACTIVITIES.

(a) TECHNOLOGY CENTERS AND TECHNICAL ASSISTANCE. —The Act of March 3, 1901, as amended by this part, is further amended by adding after section 24 the following new sections:

"REGIONAL CENTERS FOR THE TRANSFER OF MANUFACTURING TECHNOLOGY

"SEC. 25. (a) The Secretary, through the Director and, if appropriate, through other officials, shall provide assistance for the creation and support of Regional Centers for the Transfer of Manufacturing Technology (hereafter in this Act referred to as the 'Centers'). Such centers shall be affiliated with any United States-based nonprofit institution or organization, or group thereof, that applies for and is awarded financial assistance under this section in accordance with the description published by the Secretary in the Federal Register under subsection (c)(2). Individual awards shall be decided on the basis of merit review. The objective of the Centers is to enhance productivity and technological performance in United States manufacturing through—

"(1) the transfer of manufacturing technology and techniques developed at the Institute to Centers and, through them, to manufacturing companies throughout the United States;

"(2) the participation of individuals from industry, universities, State governments, other Federal agencies, and, when appropriate, the Institute in cooperative technology transfer activities;

"(3) efforts to make new manufacturing technology and processes usable by United States-based small- and medium-sized companies;

"(4) the active dissemination of scientific, engineering, technical, and management information about manufacturing to industrial firms, including small- and medium-sized manufacturing companies; and

"(5) the utilization, when appropriate, of the expertise and capability that exists in Federal laboratories other than the Institute.

"(b) The activities of the Centers shall include—

"(1) the establishment of automated manufacturing systems and other advanced production technologies, based on research by the Institute, for the purpose of demonstrations and technology transfer;

"(2) the active transfer and dissemination of research findings and Center expertise to a wide range of companies and enterprises, particularly small- and medium-sized manufacturers; and

"(3) loans, on a selective, short-term basis, of items of advanced manufacturing equipment to small manufacturing firms with less than 100 employees.

"(c)(1) The Secretary may provide financial support to any Center created under subsection (a) for a period not to exceed six years. The Secretary may not provide to a Center more than 50 percent of the capital and annual operating and maintenance funds required to create and maintain such Center.

"(2) The Secretary shall publish in the Federal Register, within 90 days after the date of the enactment of this section, a draft description of a program for establishing Centers, including—

"(A) a description of the program;

"(B) procedures to be followed by applicants;

"(C) criteria for determining qualified applicants;

"(D) criteria, including those listed under paragraph (4), for choosing recipients of financial assistance under this section from among the qualified applicants; and

"(E) maximum support levels expected to be available to Centers under the program in the fourth through sixth years of assistance under this section.

The Secretary shall publish a final description under this paragraph after the expiration of a 30-day comment period.

"(3) Any nonprofit institution, or group thereof, or consortia of nonprofit institutions, including entities existing on the date of the enactment of this section, may submit to the Secretary an application for financial support under this subsection, in accordance with the procedures established by the Secretary and published in the Federal Register under paragraph (2). In order to receive assistance under this section, an applicant shall provide adequate assurances that it will contribute 50 percent or more of the proposed Center's capital and annual operating and maintenance costs for the first three years and an increasing share for each of the last three years. Each applicant shall also submit a proposal for the allocation of the legal rights associated with any invention which may result from the proposed Center's activities.

"(4) The Secretary shall subject each such application to merit review. In making a decision whether to approve such application and provide financial support under this subsection, the Secretary shall consider at a minimum (A) the merits of the application, particularly those portions of the application regarding technology transfer, training and education, and adaptation of manufacturing technologies to the needs of particular industrial sectors, (B) the quality of service to be provided, (C) geographical diversity and extent of service area, and (D) the percentage of funding and amount of in-kind commitment from other sources.

"(5) Each Center which receives financial assistance under this section shall be evaluated during its third year of operation by an evaluation panel appointed by the Secretary. Each such evaluation panel shall be composed of private experts, none of whom shall be connected with the involved Center, and Federal officials. An official of the Institute shall chair the panel. Each evaluation panel shall measure the involved Center's performance against the objectives specified in this section. The Secretary shall not provide funding for the fourth through the sixth years of such Center's operation unless the evaluation is positive. If the evaluation is positive, the Secretary may provide continued funding through the sixth year at declining levels, which are designed to ensure that the Center no longer needs financial support from the Institute by the seventh year. In no event shall funding for a Center be provided by the Department of Commerce after the sixth year of the operation of a Center.

"(6) The provisions of chapter 18 of title 35, United States Code, shall (to the extent not inconsistent with this section) apply to the promotion of technology from research by Centers under this section.

"(d) There are authorized to be appropriated for the purposes of carrying out this section, a combined total of not to exceed $40,000,000 for fiscal years 1989 and 1990. Such sums shall remain available until expended.

"ASSISTANCE TO STATE TECHNOLOGY PROGRAMS

"SEC. 26.

(a) In addition to the Centers program created under section 25, the Secretary, through the Director and, if appropriate, through other officials, shall provide technical assistance to State technology programs throughout the United States, in order to help those programs help businesses, particularly small- and medium-sized businesses, to enhance their competitiveness through the application of science and technology.

"(b) Such assistance from the Institute to State technology programs shall include, but not be limited to—

"(1) technical information and advice from Institute personnel;

"(2) workshops and seminars for State officials interested in transferring Federal technology to businesses; and

"(3) entering into cooperative agreements when authorized to do so under this or any other Act."

(b) TECHNOLOGY EXTENSION SERVICES. —(1) The Secretary shall conduct a nationwide study of current State technology extension services. The study shall include—

(A) a thorough description of each State program, including its duration, its annual budget, and the number and types of businesses it has aided;

(B) a description of any anticipated expansion of each State program and its associated costs;

(C) an evaluation of the success of the services in transferring technology, modernizing manufacturing processes, and improving the productivity and profitability of businesses;

(D) an assessment of the degree to which State services make use of Federal programs, including the Small Business Innovative Research program and the programs of the Federal Laboratory Consortium, the National Technical Information Service, the National Science Foundation, the Office of Productivity, Technology, and Innovation, and the Small Business Administration;

(E) a survey of what additional Federal information and technical assistance the services could utilize; and

(F) an assessment of how the services could be more effective agents for the transfer of Federal scientific and technical information, including the results and application of Federal and federally funded research.

The Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate, at the time of submission of the organization plan for the Institute under section 5112(d)(1), the results of the study and

an initial implementation plan for the programs under section 26 of the Act of March 3, 1901, and under this section. The implementation plan shall include methods of providing technical assistance to States and criteria for awarding financial assistance under this section. The Secretary may make use of contractors and experts for any or all of the studies and findings called for in this section.

(2)(A) The Institute shall enter into cooperative agreements with State technology extension services to—

(i) demonstrate methods by which the States can, in cooperation with Federal agencies, increase the use of Federal technology by businesses within their States to improve industrial competitiveness; or

(ii) help businesses in their States take advantage of the services and information offered by the Regional Centers for the Transfer of Manufacturing Technology created under section 25 of the Act of March 3, 1901.

(B) Any State, for itself or for a consortium of States, may submit to the Secretary an application for a cooperative agreement under this subsection, in accordance with procedures established by the Secretary. To qualify for a cooperative agreement under this subsection, a State shall provide adequate assurances that it will increase its spending on technology extension services by an amount at least equal to the amount of Federal assistance.

(C) In evaluating each application, the Secretary shall consider—

(i) the number and types of additional businesses that will be assisted under the cooperative agreement;

(ii) the extent to which the State extension service will demonstrate new methods to increase the use of Federal technology;

(iii) geographic diversity; and

(iv) the ability of the State to maintain the extension service after the cooperative agreement has expired.

(D) States which are party to cooperative agreements under this subsection may provide services directly or may arrange for the provision of any or all of such services by institutions of higher education or other non-profit institutions or organizations.

(3) In carrying out section 26 of the Act of March 3, 1901, and this subsection, the Secretary shall coordinate the activities with the Federal Laboratory Consortium; the National Technical Information Service; the National Science Foundation; the Office of Productivity, Technology, and Innovation; the Small Business Administration; and other appropriate Federal agencies.

(4) There are authorized to be appropriated for the purposes of this subsection $2,000,000 for each of the fiscal years 1989, 1990, and 1991.

(5) Cooperative agreements entered into under paragraph (2) shall terminate no later than September 30, 1991.

(c) FEDERAL TECHNOLOGY TRANSFER ACT OF 1986. —Nothing in sections 25 or 26 of the Act of March 3, 1901, or in subsection (b) of this section shall be construed as limiting the authorities contained in the Federal Technology Transfer Act of 1986 (Public Law 99-502).

(d) NON-ENERGY INVENTIONS PROGRAM. —The Act of March 3, 1901, as amended by this part, is further amended by adding after section 26 the following new section:

"NON-ENERGY INVENTIONS PROGRAM

"SEC. 27. In conjunction with the initial organization of the Institute, the Director shall establish a program for the evaluation of inventions that are not energy-related to complement but not replace the Energy-Related Inventions Program established under section 14 of the Federal Nonnuclear Energy Research and Development Act of 1974 (Public Law 93-577). The Director shall submit an initial implementation plan for this program to accompany the organization plan for the Institute. The implementation plan shall include specific cost estimates, implementation schedules, and mechanisms to help finance the development of technologies the program has determined to have potential. In the preparation of the plan, the Director shall consult with appropriate Federal agencies, including the Small Business Administration and the Department of Energy, State and local government organizations, university officials, and private sector organizations in order to obtain advice on how those agencies and organizations might cooperate with the expansion of this program of the Institute."

"SEC. 5122. CLEARINGHOUSE ON STATE AND LOCAL INITIATIVES.

(a) CLEARINGHOUSE. —The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is amended—

(1) by redesignating sections 6 through 19 as sections 7 through 20, respectively; and

(2) by inserting after section 5 the following new section:

"SEC. 6. CLEARINGHOUSE FOR STATE AND LOCAL INITIATIVES ON PRODUCTIVITY, TECHNOLOGY, AND INNOVATION.

"(a) ESTABLISHMENT. —There is established within the Office of Productivity, Technology, and Innovation a Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation. The Clearinghouse shall serve as a central repository of information on initiatives by State and local governments to enhance the competitiveness of American business through the stimulation of productivity, technology, and innovation and Federal efforts to assist State and local governments to enhance competitiveness.

"(b) RESPONSIBILITIES. —The Clearinghouse may—

"(1) establish relationships with State and local governments, and regional and multistate organizations of such governments, which carry out such initiatives;

"(2) collect information on the nature, extent, and effects of such initiatives, particularly information useful to the Congress, Federal agencies, State and local governments, regional and multistate organizations of such governments, businesses, and the public throughout the United States;

"(3) disseminate information collected under paragraph (2) through reports, directories, handbooks, conferences, and seminars;

"(4) provide technical assistance and advice to such governments with respect to such initiatives, including assistance in determining sources of assistance from Federal agencies which may be available to support such initiatives;

"(5) study ways in which Federal agencies, including Federal laboratories, are able to use their existing policies and programs to assist State and local governments, and regional and multistate organizations of such governments, to enhance the competitiveness of American business;

"(6) make periodic recommendations to the Secretary, and to other Federal agencies upon their request, concerning modifications in Federal policies and programs which would improve Federal assistance to State and local technology and business assistance programs;

"(7) develop methodologies to evaluate State and local programs, and, when requested, advise State and local governments, and regional and multistate organizations of such governments, as to which programs are most effective in enhancing the competitiveness of American business through the stimulation of productivity, technology, and innovation; and

"(8) make use of, and disseminate, the nationwide study of State industrial extension programs conducted by the Secretary.

"(c) CONTRACTS. —In carrying out subsection (b), the Secretary may enter into contracts for the purpose of collecting information on the nature, extent, and effects of initiatives.

"(d) TRIENNIAL REPORT. —The Secretary shall prepare and transmit to the Congress once each 3 years a report on initiatives by State and local governments to enhance the competitiveness of American businesses through the stimulation of productivity, technology, and innovation. The report shall include recommendations to the President, the Congress, and to Federal agencies on the appropriate Federal role in stimulating State and local efforts in this area. The first of these reports shall be transmitted to the Congress before January 1, 1989.".

(b) DEFINITION. —Section 4 of such Act is amended by adding at the end thereof the following new paragraph:

"(13) 'Clearinghouse' means the Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation established by section 6."

(c) CONFORMING AMENDMENT. —Section 10(d) of such Act, as so redesignated by section 5122(a)(1) of this part, is amended by striking "6, 8, 10, 14, 16, or 17" and inserting in lieu thereof "7, 9, 11, 15, 17, or 18".

SUBPART C—ADVANCED TECHNOLOGY PROGRAM

SEC. 5131. ADVANCED TECHNOLOGY.

(a) ADVANCED TECHNOLOGY PROGRAM. —The Act of March 3, 1901, as amended by this part, is further amended by adding after section 27 the following new section:

"ADVANCED TECHNOLOGY PROGRAM

"SEC. 28.

(a) There is established in the Institute an Advanced Technology Program (hereafter in this Act referred to as the 'Program') for the purpose of assisting United States businesses in creating and applying the generic technology and research results necessary to—

"(1) commercialize significant new scientific discoveries and technologies rapidly; and

"(2) refine manufacturing technologies.

The Secretary, acting through the Director, shall assure that the Program focuses on improving the competitive position of the United States and its businesses, gives preference to discoveries and to technologies that have great economic potential, and avoids providing undue advantage to specific companies.

"(b) Under the Program established in subsection (a), and consistent with the mission and policies of the Institute, the Secretary, acting through the Director, and subject to subsections (c) and (d), may—

"(1) aid United States joint research and development ventures (hereafter in this section referred to as 'joint ventures') (which may also include universities and independent research organizations), including those involving collaborative technology demonstration projects which develop and test prototype equipment and processes, through—

"(A) provision of organizational and technical advice; and

"(B) participation in such joint ventures, if the Secretary, acting through the Director, determines participation to be appropriate, which may include (i) partial start-up funding, (ii) provision of a minority share of the cost of such joint ventures for up to 5 years, and (iii) making available equipment, facilities, and personnel, provided that emphasis is placed on areas where the Institute has scientific or technological expertise, on solving generic problems of specific industries, and on making those industries more competitive in world markets;

"(2) enter into contracts and cooperative agreements with United States businesses, especially small businesses, and with independent research organizations, provided that emphasis is placed on applying the Institute's research, research techniques, and expertise to those organizations' research programs;

"(3) involve the Federal laboratories in the Program, where appropriate, using among other authorities the cooperative research and development agreements provided for under section 12 of the Stevenson-Wydler Technology Innovation Act of 1980; and

"(4) carry out, in a manner consistent with the provisions of this section, such other cooperative research activities with joint ventures as may be authorized by law or assigned to the Program by the Secretary.

"(c) The Secretary, acting through the Director, is authorized to take all actions necessary and appropriate to establish and operate the Program, including—

"(1) publishing in the Federal Register draft criteria and, no later than six months after the date of the enactment of this section, following a public comment period, final criteria, for the selection of recipients of assistance under subsection (b) (1) and (2);

"(2) monitoring how technologies developed in its research program are used, and reporting annually to the Congress on the extent of any overseas transfer of these technologies;

"(3) establishing procedures regarding financial reporting and auditing to ensure that contracts and awards are used for the purposes specified in this section, are in accordance with sound accounting practices, and are not funding existing or planned research programs that would be conducted in the same time period in the absence of financial assistance under the Program;

"(4) assuring that the advice of the Committee established under section 10 is considered routinely in carrying out the responsibilities of the Institute; and

"(5) providing for appropriate dissemination of Program research results.

"(d) When entering into contracts or making awards under subsection (b), the following shall apply:

"(1) No contract or award may be made until the research project in question has been subject to a merit review, and has, in the opinion of the reviewers appointed by the Director and the Secretary, acting through the Director, been shown to have scientific and technical merit.

"(2) In the case of joint ventures, the Program shall not make an award unless, in the judgment of the Secretary, acting through the Director, Federal aid is needed if the industry in question is to form a joint venture quickly.

"(3) No Federal contract or cooperative agreement under subsection (b)(2) shall exceed $2,000,000 over 3 years, or be for more than 3 years unless a full and complete explanation of such proposed award, including reasons for exceeding these limits, is submitted in writing by the Secretary to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives. The proposed contract or cooperative agreement may be executed only after 30 calendar days on which both Houses of Congress are in session have elapsed since such submission. Federal funds made available under subsection (b)(2) shall be used only for direct costs and not for indirect costs, profits, or management fees of the contractor.

"(4) In determining whether to make an award to a particular joint venture, the Program shall consider whether the members of the joint venture have made provisions for the appropriate participation of small United States businesses in such joint venture.

"(5) Section 552 of title 5, United States Code, shall not apply to the following information obtained by the Federal Government on a confidential basis in connection with the activities of any business or any joint venture receiving funding under the Program—

"(A) information on the business operation of any member of the business or joint venture; and

"(B) trade secrets possessed by any business or any member of the joint venture.

"(6) Intellectual property owned and developed by any business or joint venture receiving funding or by any member of such a joint venture may not be disclosed by any officer or employee of the Federal Government except in accordance with a written agreement between the owner or developer and the Program.

"(7) The Federal Government shall be entitled to a share of the licensing fees and royalty payments made to and retained by any business or joint venture to which it contributes under this section in an amount proportional to the Federal share of the costs incurred by the business or joint venture as determined by independent audit.

"(8) If a business or joint venture fails before the completion of the period for which a contract or award has been made, after all allowable costs have been paid and appropriate audits conducted, the unspent balance of the Federal funds shall be returned by the recipient to the Program.

"(9) Upon dissolution of any joint venture or at the time otherwise agreed upon, the Federal Government shall be entitled to a share of the residual assets of the joint venture proportional to the Federal share of the costs of the joint venture as determined by independent audit.

"(e) As used in this section, the term 'joint research and development venture' has the meaning given to such term in section 2(a)(6) of the National Cooperative Research Act of 1984 (15 U.S.C. 4301(a)(6))."

(b) VISITING COMMITTEE ON ADVANCED TECHNOLOGY. —Section 10 of the Act of March 3, 1901, is amended to read as follows:

"VISITING COMMITTEE ON ADVANCED TECHNOLOGY

"SEC. 10.

(a) There is established within the Institute a Visiting Committee on Advanced Technology (hereafter in this Act referred to as the 'Committee'). The Committee shall consist of nine members appointed by the Director, at least five of whom shall be from United States industry. The Director shall appoint as original members of the Committee any final members of the National Bureau of Standards Visiting Committee who wish to serve in such capacity. In addition to any powers and functions otherwise granted to it by this Act, the Committee shall review and make recommendations regarding general policy for the Institute, its organization, its budget, and its programs within the framework of applicable national policies as set forth by the President and the Congress.

"(b) The persons appointed as members of the Committee—

"(1) shall be eminent in fields such as business, research, new product development, engineering, labor, education, management consulting, environment, and international relations;

"(2) shall be selected solely on the basis of established records of distinguished service;

"(3) shall not be employees of the Federal Government; and

"(4) shall be so selected as to provide representation of a cross-section of the traditional and emerging United States industries.

The Director is requested, in making appointments of persons as members of the Committee, to give due consideration to any recommendations which may be submitted to the Director by the national academies, professional societies, business associations, labor associations, and other appropriate organizations.

"(c)(1) The term of office of each member of the Committee, other than the original members, shall be 3 years; except that any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. Any person who has completed two consecutive full terms of service on the Committee shall thereafter be ineligible for appointment during the one-year period following the expiration of the second such term.

"(2) The original members of the Committee shall be elected to three classes of three members each; one class shall have a term of one year, one a term of two years, and the other a term of three years.

"(d) The Committee shall meet at least quarterly at the call of the Chairman or whenever one-third of the members so request in writing. A majority of the members of the Committee not having a conflict of interest in the matter being considered by the Committee shall constitute a quorum. Each member shall be given appropriate notice, whenever possible, not less than 15 days prior to any meeting, of the call of such meeting.

"(e) The Committee shall have an executive committee, and may delegate to it or to the Secretary such of the powers and functions granted to the Committee by this Act as it deems appropriate. The Committee is authorized to appoint from among its members such other committees as it deems necessary, and to assign to committees so appointed such survey and advisory functions as the Committee deems appropriate to assist it in exercising its powers and functions under this Act.

"(f) The election of the Chairman and Vice Chairman of the Committee shall take place at each annual meeting occurring in an even-numbered year. The Vice Chairman shall perform the duties of the Chairman in his absence. In case a vacancy occurs in the chairmanship or vice chairmanship, the Committee shall elect a member to fill such vacancy.

"(g) The Committee may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than four professional staff members and such clerical staff members as may be necessary. Such staff shall be appointed by the Director, after consultation with the Chairman of the Committee, and assigned at the direction of the Committee. The professional members of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service and the provisions of chapter 51 of title 5 of such Code relating to classification, and compensated at a rate not exceeding the appropriate rate provided for individuals in grade GS18 of the General Schedule under section 5332 of title 5 of such Code, as may be necessary to provide for the performance of such duties as may be prescribed by the Committee in connection with the exercise of its powers and functions under this Act.

"(h)(1) The Committee shall render an annual report to the Secretary for submission to the Congress on or before January 31 in each year. Such report shall deal essentially, though not necessarily exclusively, with policy issues or matters which affect the Institute, including the Program established under section 28, or with which the Committee in its official role as the private sector policy advisor of the Institute is concerned. Each such report shall identify areas of research and research techniques of the Institute of potential importance to the long-term competitiveness of United States industry, in which the Institute possesses special competence, which could be used to assist United States enterprises and United States industrial joint research and development ventures.

"(2) The Committee shall render to the Secretary and the Congress such additional reports on specific policy matters as it deems appropriate."

(c) NATIONAL ACADEMIES OF SCIENCES AND ENGINEERING STUDY OF GOVERNMENT-INDUSTRY COOPERATION IN CIVILIAN TECHNOLOGY.—

(1) Within 90 days after the date of enactment of this Act, the Secretary of Commerce shall enter into contracts with the National Academies of Sciences and Engineering for a thorough review of the various types of arrangements under which the private sector in the United States and the Federal Government cooperate in civilian research and technology transfer, including activities to create or apply generic, nonproprietary technologies. The purpose of the review is to provide the Secretary and Congress with objective information regarding the uses, strengths, and limitations of the various types of cooperative technology arrangements that have been used in the United States. The review is to provide both an analysis of the ways

in which these arrangements can help improve the technological performance and international competitiveness of United States industry, and also to provide the Academies' recommendations regarding ways to improve the effectiveness and efficiency of these types of cooperative arrangements. A special emphasis shall be placed on discussions of these subjects among industry leaders, labor leaders, and officials of the executive branch and Congress. The Secretary is authorized to seek and accept funding for this study from both Federal agencies and private industry.

(2) The members of the review panel shall be drawn from among industry and labor leaders, entrepreneurs, former government officials with great experience in civilian research and technology, and scientific and technical experts, including experts with experience with Federal laboratories.

(3) The review shall analyze the strengths and weaknesses of different types of Federal-industry cooperative arrangements in civilian technology, including but not limited to—

(A) Federal programs which provide technical services and information to United States companies;

(B) cooperation between Federal laboratories and United States companies, including activities under the Technology Share Program created by Executive order 12591;

(C) Federal research and technology transfer arrangements with selected business sectors;

(D) Federal encouragement of, and assistance to, private joint research and development ventures; and

(E) such other mechanisms of Federal-industry cooperation as may be identified by the Secretary.

(4) A report based on the findings and recommendations of the review panel shall be submitted to the Secretary, the President, and Congress within 18 months after the Secretary signs the contracts with the National Academies of Sciences and Engineering.

SUBPART D—TECHNOLOGY REVIEWS

SEC. 5141. REPORT OF PRESIDENT.

The President shall, at the time of submission of the budget request for fiscal year 1990 to Congress, also submit to the Congress a report on—

(1) the President's policies and budget proposals regarding Federal research in semiconductors and semiconductor manufacturing technology, including a discussion of the respective roles of the various Federal departments and agencies in such research;

(2) the President's policies and budget proposals regarding Federal research and acquisition policies for fiber optics and optical-electronic technologies generally;

(3) the President's policies and budget proposals, identified by agency, regarding superconducting materials, including descriptions of research priorities, the scientific and technical barriers to commercialization which such research is designed to overcome, steps taken to ensure coordination among Federal agencies conducting research on superconducting materials, and steps taken to consult with private United States industry and to ensure that no unnecessary duplication of research exists and that all important scientific and technical barriers to the commercialization of superconducting materials will be addressed; and

(4) the President's policies and budget proposals, identified by agency, regarding Federal research to assist United States industry to develop and apply advanced manufacturing technologies for the production of durable and nondurable goods.

SEC. 5142. SEMICONDUCTOR RESEARCH AND DEVELOPMENT.

(a) SHORT TITLE. —This section may be cited as the "National Advisory Committee on Semiconductor Research and Development Act of 1988".

(b) FINDINGS AND PURPOSES. —(1) The Congress finds and declares that—

(A) semiconductor technology is playing an ever-increasing role in United States industrial and commercial products and processes, making secure domestic sources of state-of-the-art semiconductors highly desirable;

(B) modern weapons systems are highly dependent on leading edge semiconductor devices, and it is counter to the national security interest to be heavily dependent upon foreign sources for this technology;

(C) governmental responsibilities related to the semiconductor industry are divided among many Federal departments and agencies; and

(D) joint industry-government consideration of semiconductor industry problems is needed at this time.

(2) The purposes of this section are—

(A) to establish the National Advisory Committee on Semiconductors; and

(B) to assign to such Committee the responsibility for devising and promulgating a national semiconductor strategy, including research and development, the implementation of which will assure the continued leadership of the United States in semiconductor technology.

(c) CREATION OF COMMITTEE. —There is hereby created in the executive branch of the Government an independent advisory body to be known as the National Advisory Committee on Semiconductors (hereafter in this section referred to as the "Committee").

(d) FUNCTIONS. —(1) The Committee shall—

(A) collect and analyze information on the needs and capabilities of industry, the Federal Government, and the scientific and research communities related to semiconductor technology;

(B) identify the components of a successful national semiconductor strategy in accordance with subsection (b)(2)(B);

(C) analyze options, establish priorities, and recommend roles for participants in the national strategy;

(D) assess the roles for government and national laboratories and other laboratories supported largely for government purposes in contributing to the semiconductor technology base of the Nation, as well as to access the effective use of the resources of United States private industry, United States universities, and private-public research and development efforts; and

(E) provide results and recommendations to agencies of the Federal Government involved in legislative, policymaking, administrative, management, planning, and technology activities that affect or are part of a national semiconductor strategy, and to the industry and other nongovernmental groups or organizations affected by or contributing to that strategy.

(2) In fulfilling this responsibility, the Committee shall—

(A) monitor the competitiveness of the United States semiconductor technology base;

(B) determine technical areas where United States semiconductor technology is deficient relative to international competition;

(C) identify new or emerging semiconductor technologies that will impact the national defense or United States competitiveness or both;

(D) develop research and development strategies, tactics, and plans whose execution will assure United States semiconductor competitiveness; and

(E) recommend appropriate actions that support the national semiconductor strategy.

(e) MEMBERSHIP AND PROCEDURES. —

(1) (A) The Committee shall be composed of 13 members, 7 of whom shall constitute a quorum.

(B) The Secretary of Defense, the Secretary of Commerce, the Secretary of Energy, the Director of the office of Science and Technology Policy, and the Director of the National Science Foundation, or their designees, shall serve as members of the Committee.

(C) The President, acting through the Director of the office of Science and Technology Policy, shall appoint, as additional members of the Committee, 4 members from outside the Federal Government who are eminent in the semiconductor industry, and 4 members from outside the Federal Government who are eminent in the fields of technology, defense, and economic development.

(D) One of the members appointed under subparagraph (C), as designated by the President at the time of appointment, shall be chairman of the Committee.

(2) Funding and administrative support for the Committee shall be provided to the office of Science and Technology Policy through an arrangement with an appropriate agency or organization designated by the Committee, in accordance with a memorandum of understanding entered into between them.

(3) Members of the Committee, other than full-time employees of the Federal Government, while attending meetings of the Committee or otherwise performing duties at the request of the Chairman while away from their homes or regular places of business, shall be allowed travel expenses in accordance with subchapter I of chapter 57 of title 5, United States Code.

(4) The Chairman shall call the first meeting of the Committee not later than 90 days after the date of the enactment of this Act.

(5) At the close of each fiscal year the Committee shall submit to the President and the Congress a report on its activities conducted during such year and its planned activities for the coming year, including specific findings and recommendations with respect to the national semiconductor strategy devised and promulgated under subsection (b)(2)(B). The first report shall include an analysis of those technical areas, including man-

ufacturing, which are of importance to the United States semiconductor industry, and shall make specific recommendations regarding the appropriate Federal role in correcting any deficiencies identified by the analysis. Each report shall include an estimate of the length of time the Committee must continue before the achievement of its purposes and the issuance of its final report.

(f) AUTHORIZATION OF APPROPRIATIONS. —There are authorized to be appropriated to carry out the purposes of this section such sums as may be necessary for the fiscal years 1988, 1989, and 1990.

SEC. 5143. REVIEW OF RESEARCH AND DEVELOPMENT PRIORITIES IN SUPERCONDUCTORS.

(a) NATIONAL COMMISSION ON SUPERCONDUCTIVITY. —The President shall appoint a National Commission on Superconductivity to review all major policy issues regarding United States applications of recent research advances in superconductors in order to assist the Congress in devising a national strategy, including research and development priorities, the development of which will assure United States leadership in the development and application of superconducting technologies.

(b) MEMBERSHIP. —The membership of the National Commission on Superconductivity shall include representatives of—

(1) the National Critical Materials Council, the National Academy of Sciences, the National Academy of Engineering, the National Science Foundation, the National Aeronautics and Space Administration, the Department of Energy, the Department of Justice, the Department of Commerce (including the National Institute of Standards and Technology), the Department of Transportation, the Department of the Treasury, and the Department of Defense;

(2) organizations whose membership is comprised of physicists, engineers, chemical scientists, or material scientists; and

(3) industries, universities, and national laboratories engaged in superconductivity research.

(c) CHAIRMAN. —A representative of the private sector shall be designated as chairman of the Commission.

(d) COORDINATION. —The National Critical Materials Council shall be the coordinating body of the National Commission on Superconductivity and shall provide staff support for the Commission.

(e) REPORT. —Within 6 months after the date of the enactment of this Act, the National Commission on Superconductivity shall submit a report to the President and the Congress with recommendations regarding methods of enhancing the research, development, and implementation of improved superconductor technologies in all major applications.

(f) SCOPE OF REVIEW. —In preparing the report required by subsection (e), the Commission shall consider addressing, but need not limit, its review to—

(1) the state of United States competitiveness in the development of improved superconductors;

(2) methods to improve and coordinate the collection and dissemination of research data relating to superconductivity;

(3) methods to improve and coordinate funding of research and development of improved superconductors;

(4) methods to improve and coordinate the development of viable commercial and military applications of improved superconductors;

(5) foreign government activities designed to promote research, development, and commercial application of improved superconductors;

(6) the need to provide increased Federal funding of research and development of improved superconductors;

(7) the impact on the United States national security if the United States must rely on foreign producers of superconductors;

(8) the benefit, if any, of granting private companies partial exemptions from United States antitrust laws to allow them to coordinate research, development, and products containing improved superconductors;

(9) options for providing income tax incentives for encouraging research, development, and production in the United States of products containing improved superconductors; and

(10) methods to strengthen domestic patent and trademark laws to ensure that qualified superconductivity discoveries receive the fullest protection from infringement.

(g) SUNSET. —The Commission shall disband within a year of its establishment. Thereafter the National Critical Materials Council may review and update the report required by subsection (e) and make further recommendations as it deems appropriate.

SUBPART E—AUTHORIZATION OF APPROPRIATIONS

SEC. 5151. AUTHORIZATION OF APPROPRIATIONS FOR TECHNOLOGY ACTIVITIES.

(a) AUTHORIZATION OF APPROPRIATIONS. —There are authorized to be appropriated for fiscal year 1988 to the Secretary of Commerce to carry out activities performed by the Institute the sums set forth in the following line items:

(1) Measurement Research and Technology: $41,939,000.

(2) Engineering Measurements and Manufacturing: $40,287,000.

(3) Materials Science and Engineering: $23,521,000.

(4) Computer Science and Technology: $7,941,000.

(5) Research Support Activities: $19,595,000.

(6) Cold Neutron Source Facility: $6,500,000 (for a total authorization of $13,000,000).

(7) Programs established under sections 25, 26, and 27 of the Act of March 3, 1901 and section 5121 of this part: $5,000,000.

(b) LIMITATIONS. —Notwithstanding any other provision of this or any other Act—

(1) of the total of the amounts authorized under subsection (a), $2,000,000 is authorized only for steel technology;

(2) of the amount authorized under paragraph (1) of subsection (a) of this section, $3,550,000 is authorized only for the purpose of research in process and quality control;

(3) of the amount authorized under paragraph (2) of subsection (a) of this section, $3,710,000 is authorized only for the Center for Building Technology, $5,662,000 is authorized only for the Center for Fire Research, and the two Centers shall not be merged;

(4) of the amount authorized under paragraph (3) of subsection (a) of this section, $1,500,000 is authorized only for the purpose of research to improve high-performance composites; and

(5) of the amount authorized under paragraph (5) of subsection (a) of this section, $7,371,000 is authorized only for technical competence fund projects in new areas of high technical importance, and $1,091,000 is authorized only for the Postdoctoral Research Associates Program and related new personnel.

(c) TRANSFER. —

(1) Funds may be transferred among the line items listed in subsection (a) of this section so long as the net funds transferred to or from any line item do not exceed 10 percent of the amount authorized for that line item in such subsection and the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives are notified in advance of any such transfer.

(2) In addition, the Secretary of Commerce may propose transfers to or from any line item exceeding 10 percent of the amount authorized for the line item in subsection (a) of this section, but a full and complete explanation of any such proposed transfer and the reason for such transfer must be transmitted in writing to the President of the Senate, the Speaker of the House of Representatives, and the appropriate authorizing committees of the Senate and House of Representatives. The proposed transfer may be made only when 30 calendar days have passed after the transmission of such written explanation.

(d) COLD NEUTRON SOURCE FACILITY. —In addition to any sums otherwise authorized by this part, there are authorized to be appropriated to the Secretary of Commerce for fiscal years 1988, 1989, and 1990 such sums as were authorized but not appropriated for the Cold Neutron Source Facility for fiscal year 1987. Furthermore, the Secretary may accept contributions for funds, to remain available until expended, for the design, construction, and equipment of the Cold Neutron Source Facility, notwithstanding the limitations of section 14 of the Act of March 3, 1901 (15 U.S.C. 278d).

(e) EMPLOYEE BENEFIT ADJUSTMENTS. —In addition to any sums otherwise authorized by this part, there are authorized to be appropriated to the Secretary of Commerce for fiscal year 1988 such additional sums as may be necessary to make any adjustments in salary, pay, retirement, and other employee benefits which may be provided for by law.

(f) AVAILABILITY. —Appropriations made under the authority provided in this section shall remain available for obligation, for expenditure, or for obligations and expenditure for periods specified in the Acts making such appropriations.

SEC. 5152. STEVENSON-WYDLER ACT AUTHORIZATIONS.

Section 19 (a) and (b) of the Stevenson-Wydler Technology Innovation Act of 1980, as so redesignated by section 5122(a)(1) of this part, is amended to read as follows:

"(a)(1) There is authorized to be appropriated to the Secretary for the purposes of carrying out sections 5, 11(g), and 16 of this Act not to exceed $3,400,000 for the fiscal year ending September 30, 1988.

"(2) of the amount authorized under paragraph (1) of this subsection, $2,400,000 is authorized only for the office of Productivity, Technology, and Innovation; $500,000 is authorized only for the purpose of carrying out the requirements of the Japanese technical literature program established under section 5(d) of this act; and $500,000 is authorized only for the patent licensing activities of the National Technical Information Service.

"(b) In addition to the authorization of appropriations provided under subsection (a) of this section, there is authorized to be appropriated to the Secretary for the purposes of carrying out section 6 of this Act not to exceed $500,000 for the fiscal year ending September 30, 1988, $1,000,000 for the fiscal year ending September 30, 1989, and $1,500,000 for the fiscal year ending September 30, 1990.".

SUBPART F—MISCELLANEOUS TECHNOLOGY AND COMMERCE PROVISIONS

SEC. 5161. SAVINGS PROVISION AND USER FEES.

The Act of March 3, 1901 (15 U.S.C. 271 et seq.), as amended by this part, is further amended by adding after section 28 the following new sections:

"SAVINGS PROVISION

"SEC. 29.

All rules and regulations, determinations, standards, contracts, certifications, authorizations, delegations, results and findings of investigations, or other actions duly issued, made, or taken by or pursuant to this Act, or under the authority of any other statutes which resulted in the assignment of functions or activities to the Secretary, the Department, the Director, or the Institute, as are in effect immediately before the date of enactment of this section, and not suspended by the Secretary, the Director, the Institute or the courts, shall continue in full force and effect after the date of enactment of this section until modified or rescinded.

"USER FEES

"SEC. 30.

The Institute shall not implement a policy of charging fees with respect to the use of Institute research facilities by research associates in the absence of express statutory authority to charge such fees."

SEC. 5162. MISCELLANEOUS AMENDMENTS TO THE STEVENSON-WYDLER ACT.

(a) INVENTION MANAGEMENT SERVICES. —The first sentence of section 14(a)(4) of the Stevenson-Wydler Technology Innovation Act of 1980, as so redesignated by section 5122(a)(1) of this part (15 U.S.C. 3710c) is amended by striking out "shall" and inserting in lieu thereof "may", and by striking out "such invention performed at the request of the other agency or laboratory" and inserting in lieu thereof "any invention of the other agency".

(b) FEDERAL LABORATORY CONSORTIUM. —Section 11(e)(7)(A) of the Stevenson-Wydler Technology Innovation act of 1980, as so redesignated by section 5122(a)(1) of this part (15 U.S.C. 3710) is amended by striking out "0.005 percent of that portion of the research and development budget of each Federal agency that is to be utilized by" and inserting in lieu thereof "0.008 percent of the budget of each Federal agency from any Federal source, including related overhead, that is to be utilized by or on behalf of".

SEC. 5163. MISCELLANEOUS TECHNOLOGY AND COMMERCE PROVISIONS.

(a) ASSESSMENT OF EMERGING TECHNOLOGIES. —The Board of Assessment of the National Institute of Standards and Technology shall include, as part of its annual review, an assessment of emerging technologies which are expected to require research in metrology to keep the Institute abreast of its mission, including process and quality control, engineering databases, advanced materials, electronics and fiber optics, bioprocess engineering, and advanced computing concepts. Such review shall include estimates of the cost of the required effort, required staffing levels, appropriate interaction with industry, including technology transfer, and the period over which the research will be required.

(b) SMALL BUSINESS PLAN. —The Director of the National Institute of Standards and Technology shall prepare a plan detailing the manner in which the Institute will make small businesses more aware of the Institute's activities and research, and the manner in which the Institute will seek to increase the application by small businesses of the Institute's research, particularly in manufacturing. The plan shall be submitted to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives not later than 120 days after the date of the enactment of this act.

(c) NATIONAL TECHNICAL INFORMATION SERVICE. —(1) Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980, as so redesignated by section 5122(a)(1) of this part, is amended by inserting at the end the following new subsection:

"(h) None of the activities or functions of the National Technical Information Service which are not performed by contractors as of September 30, 1987, shall be contracted out or otherwise transferred from the Federal Government unless such transfer is expressly authorized by statute, or unless the value of all work performed under the contract and related contracts in each fiscal year does not exceed $250,000."

(2) The Secretary of Commerce shall report the Secretary's recommendations for improvements in the National Technical Information Service (including methods for automating document distribution and inventory control), and any statutory changes required to make such improvements, to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives by January 31, 1989.

(3) Section 11(d) of the Stevenson-Wydler Technology Innovation Act of 1980. as so redesignated by section 5122(a)(1) of this part, is amended—

(A) by striking "and" at the end of paragraph (4);

(B) by striking the period at the end of paragraph (5) and inserting in lieu thereof "; and"; and

(C) by adding at the end thereof the following new paragraph:

"(6) maintain a permanent archival repository and clearinghouse for the collection and dissemination of nonclassified scientific, technical, and engineering information."

(d) FELLOWSHIP PROGRAM. —There is established within the Department of Commerce a Commerce, Science, and Technology Fellowship Program with the stated purpose of providing a select group of employees of the executive branch of the Government with the opportunity of learning how the legislative branch and other parts of the executive branch function through work experiences of up to one year. The Secretary of Commerce shall report to the Congress within six months after the date of enactment of this Act on the Department of Commerce's plans for implementing such Program by March 31, 1989.

SEC. 5164. METRIC USAGE.

(a) FINDINGS. —Section 2 of the Metric Conversion Act of 1975 is amended by adding at the end thereof the following new paragraphs:

"(3) World trade is increasingly geared towards the metric system of measurement.

"(4) Industry in the United States is often at a competitive disadvantage when dealing in international markets because of its nonstandard measurement system, and is sometimes excluded when it is unable to deliver goods which are measured in metric terms.

"(5) The inherent simplicity of the metric system of measurement and standardization of weights and measures has led to major cost savings in certain industries which have converted to that system.

"(6) The Federal Government has a responsibility to develop procedures and techniques to assist industry, especially small business, as it voluntarily converts to the metric system of measurement.

"(7) The metric system of measurement can provide substantial advantages to the Federal Government in its own operations."

(b) POLICY. —Section 3 of the Metric Conversion Act of 1975 is amended to read as follows:

"SEC. 3. It is therefore the declared policy of the United States—

"(1) to designate the metric system of measurement as the preferred system of weights and measures for United States trade and commerce;

"(2) to require that each Federal agency, by a date certain and to the extent economically feasible by the end of the fiscal year 1992, use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms, such as when foreign competitors are producing competing products in non-metric units;

"(3) to seek out ways to increase understanding of the metric system of measurement through educational information and guidance and in Government publications; and

"(4) to permit the continued use of traditional systems of weights and measures in nonbusiness activities."

(c) IMPLEMENTATION. —The Metric Conversion Act of 1975 is further amended by redesignating section 12 as section 13, and by inserting after section 11 the following new section:

"SEC. 12.

(a) As soon as possible after the date of the enactment of this section, each agency of the Federal Government shall establish guidelines to carry out the policy set forth in section 3 (with particular emphasis upon the policy set forth in paragraph (2) of that section), and as part of its annual budget submission for each fiscal year beginning after such date shall report to the Congress on the actions which it has taken during the previous fiscal year, as well as the actions which it plans for the fiscal year involved, to implement fully the metric system of measurement in accordance with that policy. Such reporting shall cease for an agency in the fiscal year after it has fully implemented its efforts under section 3(2). As used in this section, the term 'agency of the Federal Government' means an Executive agency or military department as those terms as defined in chapter 1 of title 5, United States Code.

"(b) At the end of the fiscal year 1992, the Comptroller General shall review the implementation of this Act, and upon completion of such review shall report his findings to the Congress along with any legislative recommendations he may have."

* * * * *

October 24, 1988, 102 Stat. 2589 (Public Law 100-519—100th Congress, 2d session) National Institute of Standards and Technology Authorization Act for Fiscal Year 1989.

Public Law 100-519

AN ACT

To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal year 1989, and for other purposes.

TITLE I—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AUTHORIZATION

SECTION 101. SHORT TITLE.

This title may be cited as the "National Institute of Standards and Technology Authorization Act for Fiscal Year 1989".

SEC. 102. AUTHORIZATIONS FOR PROGRAM ACTIVITIES.

(a) AUTHORIZATIONS. —There are authorized to be appropriated to the Secretary of Commerce (hereafter in this Act referred to as the "Secretary"), for fiscal year 1989, to carry out activities performed by the National Institute of Standards and Technology, the sums set forth in the following line items:

(1) Measurement Research and Standards, $43,220,000.

(2) Materials Science and Engineering, $24,054,000.

(3) Engineering Measurements and Standards, $49,098,000.

(4) Computer Science and Technology, $11,000,000.

(5) Research Support Activities, $20,867,000.

(6) Cold Neutron Source Facility, $6,500,000 (for a total authorization of $19,500,000).

(7) Technology Services, $3,300,000.

(b) LIMITATIONS. —Notwithstanding any other provision of this or any other Act—

(1) of the total of the amounts authorized under subsection (a), $2,000,000 is authorized only for steel technology;

(2) of the total amount authorized under paragraph (3) of subsection (a)—

(A) $4,000,000 is authorized only for the Center for Building Technology, and

(B) $6,000,000 is authorized only for the Center for Fire Research, and the two Centers shall not be merged;

(3) of the total amount authorized under paragraph (5) of subsection (a), $7,500,000 is authorized only for the technical competence fund; and

(4) of the amount authorized under paragraph (7) of subsection (a)—

(A) $3,000,000 is authorized only for the support of Regional Centers for the Transfer of Manufacturing Technology, and Assistance to State Technology Programs;

(B) $300,000 is authorized only for the evaluation of nonenergy-related inventions and related technology extension activities; and

(C) funds authorized under subparagraph (A) shall be used only to award, amend, or renew research cooperative agreements entered into pursuant to the competitive process established by the National Bureau of Standards for this program (53 Fed. Reg. 27060; July 18, 1988).

(c) TRANSFERS. —

(1) Funds may be transferred among the line items listed in subsection (a), so long as the net funds transferred to or from any line item do not exceed 10 percent of the amount authorized for that line item in such subsection and the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives are notified in advance of any such transfer.

(2) In addition, the Secretary may propose transfers to or from any line item exceeding 10 percent of the amount authorized for the line item in subsection (a); but such proposed transfer may not be made—

(A) unless a full and complete explanation of any such proposed transfer and the reason therefore are transmitted in writing to the Speaker of the House of Representatives, the President of the Senate, and the appropriate authorizing committees of the House of Representatives and the Senate, and

(B) 30 calendar days have passed following the transmission of such written explanation.

(d) PUBLICATION IN FEDERAL REGISTER. —The requirement of section 25(c)(2) of the Act of March 3, 1901, shall be considered to have been met by the publication made by the National Bureau of Standards on July 18, 1988 (53 Fed. Reg. 27060).

SEC. 103. UNDER SECRETARY FOR TECHNOLOGY.

In addition to any sums otherwise authorized by this title, there are authorized to be appropriated to the Secretary for fiscal year 1989—

(1) $1,000,000 for the activities of the Office of the Under Secretary of Commerce for Technology, as established in section 201(a); and

(2) $2,000,000 for the activities of the Office of Technology Policy, as established in such section.

SEC. 104. JAPANESE TECHNICAL LITERATURE.

In addition to any sums otherwise authorized by this title, there is authorized to be appropriated to the Secretary for fiscal year 1989 the sum of $1,000,000 to carry out the purposes of the Japanese Technical Literature Act of 1986 (Public Law 99-382; 100 Stat. 811).

SEC. 105. SALARY ADJUSTMENTS.

In addition to any sums otherwise authorized by this title, there are authorized to be appropriated to the Secretary for fiscal year 1989 such additional sums as may be necessary to make any adjustments in salary, pay, retirement, and other employee benefits which may be provided for by law.

SEC. 106. AVAILABILITY OF APPROPRIATIONS.

Appropriations made under the authority provided in this title shall remain available for obligation, for expenditure, or for obligation and expenditure for periods specified in the Acts making such appropriations.

SEC. 107. RESEARCH INFORMATION CENTER.

The Research Information Center of the National Bureau of Standards shall be maintained as a governmental activity under the National Institute of Standards and Technology.

SEC. 108. EVALUATED ENGINEERING DATA STUDY.

Within 6 months after the date of the enactment of this Act, the Director of the National Institute of Standards and Technology shall conduct a study of needs within the private and public sectors for evaluated engineering data, and shall submit a report to the Congress making recommendations concerning the appro-

priate roles of the National Institute of Standards and Technology, other government agencies, professional societies, and trade associations in the collection, evaluation, and dissemination of such data. Such recommendations shall, among other things, address plans for the dissemination of the results of the study through data bases, and plans for incorporating high quality results from other countries.

SEC. 109. TECHNOLOGY SERVICES.

In addition to such other technology services and technology extension activities which may be mandated or authorized by law, and in order to help improve the use of technology by small and medium-sized industrial firms within the United States, the Director of the National Institute of Standards and Technology, as appropriate, shall—

(1) work directly with States, local governments, and other appropriate organizations to provide for extended distribution of Standard Reference Materials, Standard Reference Data, calibrations, and related technical services and to help transfer other expertise and technology to the States and to small businesses and other businesses within the States;

(2) evaluate those inventions from small businesses or individuals which have a significant potential for improving competitiveness;

(3) provide support for workshops on technical and entrepreneurial topics and share information developed through the Malcolm Baldrige Quality Award Program; and

(4) work with other Federal agencies to provide technical and related assistance to the States and businesses within the States.

SEC. 110. TECHNOLOGY TRANSFER.

Within 6 months after the date of the enactment of this Act, the Director of the National Institute of Standards and Technology shall report to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives on domestic technology transfer accomplishments, trends, and plans since 1986 at the National Bureau of Standards and the National Institute of Standards and Technology. Such report shall describe with examples the types of technology transfer undertaken by the National Bureau of Standards or the National Institute of Standards and Technology, the amount of funds devoted to these efforts, and patent and licensing activities related to the National Bureau of Standards and the National Institute of Standards and Technology research results. The report shall describe the division of technology transfer activities between the Gaithersburg, Maryland, and Boulder, Colorado, sites of the National Institute of Standards and Technology. The merits of establishing a technology transfer office in Boulder or of giving the Boulder laboratories increased technology transfer responsibilities shall also be considered.

SEC. 111.

ANNUAL BUDGET SUBMISSION.

The National Institute of Standards and Technology shall annually submit to the Congress, at the time of the release of the President's budget, a three year budget estimate for the Institute, including funding estimates for each major account and new initiative.

SEC. 112.

INTERNATIONAL STANDARDS.

(a) PROGRAM. —The Secretary, acting through the Director of the National Institute of Standards and Technology and other appropriate officials, shall seek funding for and establish, within 6 months after the date of the enactment of this Act, a program to assist other countries in the development of their domestic standards which are compatible with standards in general use in the United States. After the program is established, it shall be funded through voluntary contributions from the private sector to fully reimburse the United States for expenses incurred during fiscal years 1989 and 1990. The program shall begin on a pilot basis focusing on one or two countries or groups of countries which are major United States trading partners

and have expressed interest in such program. The Secretary shall ensure that contributions which are earmarked by country are spent to assist the development of standards by that country or group of countries.

(b) LONG-TERM PLAN. —No later than June 30, 1989, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a long-term plan for assistance under this section for each nation or group of nations which annually has imports of at least $1,000,000,000 from the United States (or has the potential for being a major importer from the United States) and which desires such assistance. The plan shall include a description of the resources needed to provide such assistance, the appropriate and likely sources of such funds, and the appropriate relationship between the program established under this section and private sector standards organizations. Special consideration is to be given to the feasibility of establishing a data base and other methods for making standards information developed in cooperation with one country available to other countries.

TITLE II—TECHNOLOGY ADMINISTRATION IN THE DEPARTMENT OF COMMERCE

SUBTITLE A—TECHNOLOGY ADMINISTRATION

SEC. 201. TECHNOLOGY ADMINISTRATION.

(a) ESTABLISHMENT. —Section 5(a) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704(a)) is amended to read as follows:

(a) ESTABLISHMENT. —There is established in the Department of Commerce a Technology Administration, which shall operate in accordance with the provisions, findings, and purposes of this Act. The Technology Administration shall include—

"(1) the National Institute of Standards and Technology;

"(2) the National Technical Information Service; and

"(3) a policy analysis office, which shall be known as the Office of Technology Policy."

(b) UNDER SECRETARY AND ASSISTANT SECRETARY. —Section 5(b) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704(b)) is amended to read as follows:

(b) UNDER SECRETARY AND ASSISTANT SECRETARY. —The President shall appoint, by and with the advice and consent of the Senate, to the extent provided for in appropriations Acts—

"(1) an Under Secretary of Commerce for Technology, who shall be compensated at the rate provided for level III of the Executive Schedule in section 5314 of title 5, United States Code; and

"(2) an Assistant Secretary of Commerce for Technology Policy, who shall serve as policy analyst for the Under Secretary."

(c) DUTIES. —Section 5(c) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704(c)) is amended—

(1) by redesignating paragraphs (1) through (10) as paragraphs (5) through (14), respectively;

(2) by striking "Assistant Secretary, on a continuing basis, shall—" and inserting in lieu thereof "Under Secretary, as appropriate, shall—

"(1) manage the Technology Administration and supervise its agencies, programs, and activities;

"(2) conduct technology policy analyses to improve United States industrial productivity, technology, and innovation, and cooperate with United States industry in the improvement of its productivity, technology, and ability to compete successfully in world markets;

"(3) carry out any functions formerly assigned to the Office of Productivity, Technology, and Innovation

"(4) assist in the implementation of the Metric Conversion Act of 1975;" and

(3) in paragraph (10), as redesignated by paragraph (1) of this subsection, by striking "Assistant Secretary" and inserting in lieu thereof "Under Secretary".

(d) CONFORMING AMENDMENTS. —

(1) Section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703) is amended—

(A) in paragraph (1), by striking "Productivity, Technology, and Innovation" and inserting in lieu thereof "Technology Policy"; and

(B) by amending paragraph (3) to read as follows:

"(3) 'Under Secretary' means the Under Secretary of Commerce for Technology appointed under section 5(b)(1).".

(2) Section 5(d)(1) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704(d)(1)) is amended by striking "shall establish and, through the National Technical Information Service and" and inserting in lieu thereof "and the Under Secretary shall establish, and through the National Technical Information Service and with the cooperation of".

(3) Section 11(g)(1) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710(g)(1)) is amended by inserting "through the Under Secretary, and" after "Secretary,"

(4) Section 5314 of title 5, United States Code, is amended by adding at the end the following item: "Under Secretary of Commerce for Technology."

(e) TRANSITION. —The individual serving as the Assistant Secretary of Commerce for Productivity, Technology, and Innovation immediately before the date of enactment of this Act shall serve as Acting Assistant Secretary of Commerce for Technology Policy until the Assistant Secretary takes office.

SUBTITLE B—NATIONAL TECHNICAL INFORMATION SERVICE

SEC. 211.

SHORT TITLE.

This subtitle may be cited as the "National Technical Information Act of 1988".

SEC. 212.

NATIONAL TECHNICAL INFORMATION SERVICE.

(a) POWERS. —(1) The Secretary of Commerce, acting through the Director of the National Technical Information Service (hereafter in this subtitle referred to as the "Director") is authorized to do the following:

(A) Enter into such contracts, cooperative agreements, joint ventures, and other transactions, in accordance with all relevant provisions of Federal law applicable to such contracts and agreements, and under reasonable terms and conditions, as may be necessary in the conduct of the business of the National Technical Information Service (hereafter in this subtitle referred to as the "Service").

(B) In addition to the authority regarding fees contained in section 2 of the Act entitled "An Act to provide for the dissemination of technological, scientific, and engineering information to American business and industry, and for other purposes" enacted September 9, 1950 (15 U.S.C. 1152), retain and, subject to appropriations Acts, utilize its net revenues to the extent necessary to implement the plan submitted under subsection (f)(3)(D).

(C) Enter into contracts for the performance of part or all of the functions performed by the Promotion Division of the Service prior to the date of the enactment of this Act. The details of any such contract, and a statement of its effect on the operations and personnel of the Service, shall be provided to the appropriate committees of the Congress 30 days in advance of the execution of such contract.

(D) Employ such personnel as may be necessary to conduct the business of the Service. An increase or decrease in the personnel of the Service shall not affect or be affected by any ceilings on the number or grade of personnel.

(2) The functions and activities of the Service specified in subsection (e) (1) through (6) are permanent Federal functions to be carried out by the Secretary through the Service and its employees, and shall not be transferred from the Service, by contract or otherwise, to the private sector on a permanent or temporary basis without express approval of the Congress. Functions or activities—

(A) for the procurement of supplies, materials, and equipment by the Service;

(B) referred to in paragraph (1)(C); or

(C) to be performed through joint ventures or cooperative agreements which do not result in a reduction in the Federal workforce of the affected programs of the service, shall not be considered functions or activities for purposes of this paragraph.

(3) For the purposes of this subsection, the term "net revenues" means the excess of revenues and receipts from any source, other than royalties and other income described in section 13(a)(4) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c(a)(4)), over operating expenses.

(4) Section 11(h) of the Stevenson-Wydler Technology Innovation Act of 1980 is repealed.

(b) DIRECTOR OF THE SERVICE. —The management of the Service shall be vested in a Director who shall report to the Under Secretary of Commerce for Technology and the Secretary of Commerce.

(c) ADVISORY BOARD. —(1) There is established the Advisory Board of the National Technical Information Service, which shall be composed of a chairman and four other members appointed by the Secretary.

(2) In appointing members of the Advisory Board the Secretary shall solicit recommendations from the major users and beneficiaries of the Service's activities and shall select individuals experienced in providing or utilizing technical information.

(3) The Advisory Board shall review the general policies and operations of the Service, including policies in connection with fees and charges for its services, and shall advise the Secretary and the Director with respect thereto.

(4) The Advisory Board shall meet at the call of the Secretary, but not less often than once each six months.

(d) AUDITS. —The Secretary of Commerce shall provide for annual independent audits of the Service's financial statements beginning with fiscal year 1988, to be conducted in accordance with generally accepted accounting principles.

(e) FUNCTIONS. —The Secretary of Commerce, acting through the Service, shall—

(1) establish and maintain a permanent repository of nonclassified scientific, technical, and engineering information;

(2) cooperate and coordinate its operations with other Government scientific, technical, and engineering information programs;

(3) make selected bibliographic information products available in a timely manner to depository libraries as part of the Depository Library Program of the Government Printing Office;

(4) in conjunction with the private sector as appropriate, collect, translate into English, and disseminate unclassified foreign scientific, technical, and engineering information;

(5) implement new methods or media for the dissemination of scientific, technical, and engineering information; and

(6) carry out the functions and activities of the Secretary under the Act entitled "An Act to provide for the dissemination of technological, scientific, and engineering information to American business and industry, and for other purposes" enacted September 9, 1950, and the functions and activities of the Secretary performed through the National Technical Information Service as of the date of enactment of this Act under the Stevenson-Wydler Technology Innovation Act of 1980.

(f) NOTIFICATION OF CONGRESS. —

(1) The Secretary of Commerce and the Director shall keep the appropriate committees of Congress fully and currently informed about all activities related to the carrying out of the functions of the Service, including changes in fee policies.

(2) Within 90 days after the date of the enactment of this Act, the Secretary of Commerce shall submit to the Congress a report on the current fee structure of the Service, including an explanation of the basis for the fees, taking into consideration all applicable costs, and the adequacy of the fees, along with reasons for the declining sales at the Service of scientific, technical, and engineering publications. Such report shall explain any actions planned or taken to increase such sales at reasonable fees.

(3) The Secretary shall submit an annual report to the Congress which shall—

(A) summarize the operations of the Service during the preceding year, including financial details and staff levels broken down by major activities;

(B) detail the operating plan of the Service, including specific expense and staff needs, for the upcoming year;

(C) set forth details of modernization progress made in the preceding year;

(D) describe the long-term modernization plans of the Service; and

(E) include the results of the most recent annual audit carried out under subsection (d).

(4) The Secretary shall also give the Congress detailed advance notice of not less than 30 calendar days of—

(A) any proposed reduction-in-force;

(B) any joint venture or cooperative agreement which involves a financial incentive to the joint venturer or contractor; and

(C) any change in the operating plan submitted under paragraph (3)(B) which would result in a variation from such plan with respect to expense levels of more than 10 percent.

TITLE III—MISCELLANEOUS AMENDMENTS TO STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980

SEC. 301. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.

Section 12 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a) is amended—

(1) in subsection (a)(2), by striking "at the laboratory and other inventions" and inserting in lieu thereof "or other intellectual property developed at the laboratory and other inventions or other intellectual property"; and

(2) in subsection (b)—

(A) by striking "and" at the end of paragraphs (2) and (3);

(B) by redesignating paragraph (4) as paragraph (5); and

(C) by inserting after paragraph (3) the following new paragraph:

"(4) determine rights in other intellectual property developed under an agreement entered into under subsection (a)(1); and".

SEC. 302. REWARDS.

Section 13(1) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710b(1)) is amended by inserting "computer software", after "inventions, innovations,"

SEC. 303. DISTRIBUTION OF ROYALTIES.

(a) Section 14(a)(1)(A) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c(a)(1)(A)) is amended—

(1) in clause (i), by striking "was an employee of the agency at the time the invention was made" and inserting in lieu thereof "has assigned his or her rights in the invention to the United States"; and

(2) in clause (ii), by striking "who were employed by the agency at the time the invention was made and whose names appear on licensed inventions" and inserting in lieu thereof "under clause (i)".

(b) This section shall be effective as of October 20, 1986.

TITLE IV—DRUG-FREE WORKPLACE

SEC. 401. DRUG-FREE WORKPLACE.

(a) No department, agency, or instrumentality of the United States receiving funds authorized to be appropriated under this Act for fiscal year 1989 or under any other Act authorizing appropriations for fiscal year 1989 for the National Institute of Standards and Technology (hereafter in this section referred to as the "Institute"), shall obligate or expend any such funds, unless the Institute has in place, and will continue to administer in good faith, a written policy designed to ensure that all of its workplaces are free from the illegal use, possession, or distribution of controlled substances (as defined in the Controlled Substances Act) by the officers and employees of the Institute.

(b) No funds so authorized to be appropriated to the Institute for fiscal year 1989 shall be available for payment in connection with any grant, contract, or other agreement, unless the recipient of such grant, contractor, or party to such agreement, as the case may be, has in place and will continue to administer in good faith a written policy, adopted by such recipient, contractor, or party's board of directors or other governing authority, satisfactory to the Director of the Institute, designed to ensure that all of the workplaces of such recipient, Contractor, or party are free from the illegal use, possession, or distribution of controlled substances (as defined in the Controlled Substances Act) by the officers and employees of such recipient, contractor, or party.

* * * * *

November 17, 1988, 102 Stat. 4073 (Public Law 100-680—100th Congress, 2d session) Steel and Aluminum Energy Conservation and Technology Competitiveness Act of 1988.

Public Law 100-680

AN ACT

To promote energy conservation and technology competitiveness in the American steel and aluminum industries.

SEC. 7. (102 Stat. 4076) The National Institute of Standards and Technology, through its Institute for Materials Science and Engineering and, as appropriate, in coordination with the Department of Energy and other Federal agencies, shall conduct an expanded program of steel and aluminum research to provide necessary instrumentation and measurement research and development in support of activities conducted under this Act.

* * * * *

November 19, 1988, 102 Stat. 4613 (Public Law 100-697—100th Congress, 2d session) National Superconductivity and Competitiveness Act of 1988.

Public Law 100-697

AN ACT

To establish a national Federal program effort in close collaboration with the private sector to develop as rapidly as possible the applications of superconductivity to enhance the Nation's economic competitiveness and strategic well-being, and for other purposes.

SEC. 5. (102 Stat. 4615) In pursuance of the goals of this Act, the National Institute of Standards and Technology shall promote fundamental research and materials standards to accelerate the use and application of the new superconducting materials, and shall utilize the Superconductivity Center Focusing on Electronic Applications at the National Institute of Standards and Technology in Boulder, Colorado.

* * * * *

November 21, 1989, 103 Stat. 988 (Public Law 101-162—101th Congress, 1st session) Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations act, 1990 Appropriations Act, 1990.

Public Law 101-162

AN ACT

Making appropriations for the Departments of Commerce, Justice, and State, the Judiciary, and related agencies for the fiscal year ending September 30, 1990, and for other purposes.

(103 Stat. 993) National Institute of Standards and Technology. Scientific and Technical Research and Services. For necessary expenses of the core programs of the National Institute of Standards and Technology, $144,809,000, to remain available until expended, of which not to exceed $3,430,000 may be transferred to the "Working Capital Fund"; and of which not to exceed $1,300,000 shall be available for construction of research facilities; and in addition for grants for regional centers for the transfer of manufacturing technology as authorized by section 5121 of the Omnibus Trade and Competitiveness Act of 1988, $7,500,000, to remain available until expended; and in addition for expenses of the Advanced Technology Program as authorized by section 5131 of the Omnibus Trade and Competitiveness Act of 1988, $10,000,000, to remain available until expended; and in addition for technology transfer extension services pursuant to section 5121 of the Omnibus Trade and Competitiveness Act of 1988, $1,300,000, to remain available until expended.

* * * * *

December 11, 1989, 103 Stat. 1859 (Public Law 101-218—101th Congress, 1st session) Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989.

Public Law 101-218

AN ACT

To provide Federal assistance and leadership to a program of research, development, and demonstration of renewable energy and energy efficiency technologies, and for other purposes.

Sec. 6. (3) (103 Stat. 1863) Advisory Committee. The Secretary shall establish an Advisory Committee on Renewable Energy and Energy Efficiency Joint Ventures.... to advise the Secretary on the development of the solicitation and evaluation criteria for joint ventures....The Secretary shall appoint members to the Advisory committee, including at least one member representing-....the National Institute of Standards and Technology....

* * * * *

August 10, 1990, 104 Stat. 405 (Public Law 101-352—101th Congress, 2d session) Fire Safe Cigarette Act of 1990.

Public Law 101-352

AN ACT

To direct the completion of the research recommended by the Technical Study Group on Cigarette and Little Cigar Fire Safety and to provide for an assessment of the practicality of a cigarette fire safety performance standard.

SEC. 2 (a) (104 Stat. 405) Center for Fire Research.—

At the request of the Consumer Product Safety Commission, the National Institute for Standards and Technology's Center for Fire Research shall—

(1) develop a standard test method to determine cigarette ignition propensity,

(2) compile performance data for cigarettes using the standard test method developed under paragraph (1), and

(3) conduct laboratory studies on and computer modeling of ignition physics to develop valid, user-friendly predictive capability.

SEC. 3. (a) (104 Stat. 406) Establishment.—

There is established the Technical Advisory Group to advise and work with the Consumer Product Safety Commission and National Institute for Standards and Technology's Center for Fire Research on the implementation of this Act.

SEC. 5. (a) (104 Stat. 406) In General.—

Any information provided to the National Institute for Standards and Technology's Center for Fire Research...is designated as trade secret or confidential information...

* * * * *

August 18, 1990, 104 Stat. 484 (Public Law 101-380—101th Congress, 2d session) Oil Pollution Act of 1990.

Public Law 101-380

AN ACT

To establish limitations on liability for damages resulting from oil pollution, to establish a fund for the payment of compensation for such damages, and for other purposes.

Title VII-Oil Pollution Research and Development Program.

SEC. 7001.

(a) (104 Stat. 559) Interagency Coordinating Committee on Oil Pollution Research.

(3) Membership.-The Interagency Committee shall include representatives from the Department of Commerce (including the National Oceanic and Atmospheric Administration and the National Institute of Standards and Technology)...

(b) Oil Pollution Research and Technology Plan.—

(2) ... The National Institute of Standards and Technology shall provide the Interagency Committee with advice and guidance on issues relating to quality assurance and standards measurements relating to its activities under this section.

* * * * *

November 5, 1990, 104 Stat. 1388 (Public Law 101-508—101th Congress, 2d session) Omnibus Budget Reconciliation Act of 1990.

Public Law 101-508

AN ACT

To provide for reconciliation pursuant to section 4 of the concurrent resolution on the budget for fiscal year 1991.

SEC. 10205. (104 Stat. 1388-394) National Institute of Standards and Technology Cost Recovery Study.

(a) The Secretary of Commerce shall undertake a study of current practices at, and any suggested improvements consistent with the mission of, the National Institute of Standards and Technology for recovering the costs of services and materials provided to private and nonprofit organizations, including services provided on a proprietary basis to users of Institute facilities.

* * * * *

November 5, 1990, 104 Stat. 2101 (Public Law 101-515—101th Congress, 2d session) Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1991.

Public Law 101-515

AN ACT

Making appropriations for the Departments of Commerce, Justice, and State, the Judiciary, and related agencies for the fiscal year ending September 30, 1991, and for other purposes.

(104 Stat. 2106-7) National Institute of Standards and Technology. Scientific and Technical Research and Services. For necessary expenses of the National Institute of Standards and Technology, $166,228,000, to remain available until expended, of which not to exceed $9,772,000 may be transferred to the "Working Capital Fund"; and of which not to exceed $10,095,000 shall be available for construction of research facilities. Industrial Technology Services. For necessary expenses of the Regional Centers for the transfer of Manufacturing Technology, and the Advanced Technology and State Extension Services programs of the National Institute of Standards and Technology, $49,100,000, to remain available until expended. Sec. 105. (a) (104 Stat. 2108) Funds appropriated by this Act to the National Institute of Standards and Technology of the Department of Commerce for the Advanced Technology Program shall be available for award to companies or to joint ventures under the terms and conditions set forth in subsection (b) of this section, in addition to any terms and conditions established by rules issued by the Secretary of Commerce.

* * * * *

November 15, 1990, 104 Stat. 2399 (Public Law 101-549—101st, Congress, 2d session) Clean Air Act, Amendments.

Public Law 101-549

AN ACT

To amend the Clean Air Act to provide for attainment and maintenance of health protective national ambient air quality standards, and for other purposes.

SEC. 901. (b) (104 Stat. 2701-2702) Title IX-Clean Air Research.

"(A) The creation of an Interagency Task Force to coordinate such program. The Task Force shall include representatives of the ..., the National Institute of Standards and Technology, ...

* * * * *

November 15, 1990, 104 Stat. 2814 (Public Law 101-574—101th Congress, 2d session) Small Business Administration Reauthorization and Amendments Act of 1990.

Public Law 101-574

AN ACT

To amend the Small Business Act and the Small Business Investment Act of 1958, and for other purposes.

SEC. 232. (104 Stat. 2824) Pilot Technology Access Program.

(a) Establishment.-The Small Business Administration, in consultation with the National Institute of Standards and Technology and the National Technical Information Service, shall establish a Pilot Technology Access Program (hereafter in this section referred to as the "Program"), for making grants under this section to a maximum of 5 States.

* * * * *

November 16, 1990, 104 Stat. 2943 (Public Law 101-592—101th Congress, 2d session) Fastener Quality Act.

Public Law 101-592

AN ACT

To require that certain fasteners sold in commerce conform to the specifications to which they are represented to be manufactured, to provide for accreditation of laboratories engaged in fastener testing, to require inspection, testing, and certification, in accordance with standardized methods, of fasteners used in critical applications to increase fastener quality and reduce the danger of fastener failure, and for other purposes.

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

[*1] SECTION 1.

SHORT TITLE.

This Act may be cited as the "Fastener Quality Act".

[*3] SEC. 3. DEFINITIONS.

As used in this Act, the term—

(4) "Director" means the Director of the National Institute of Standards and Technology;

(8) "Institute" means the National Institute of Standard and Technology;

(13) "Secretary" means the Secretary of Commerce;

SEC. 6. LABORATORY ACCREDITATION.

(a) ESTABLISHMENT OF ACCREDITATION PROGRAM. —(1) Within 180 days after the date of enactment of this Act, the Secretary, acting through the Director, shall issue regulations which shall include—

(A) procedures and conditions, including sampling procedures referred to in section 5, for the accreditation by the Institute of laboratories engaged in the inspection and testing of fasteners under section 5;

(B) procedures and conditions (which shall be consistent with the procedures and conditions established under subparagraph (A)), using to the extent practicable the requirements of national or international consensus documents intended to govern the operation of accreditation bodies, under which private entities may apply for approval by the Secretary to engage directly in the accreditation of laboratories in accordance with the requirements of this Act; and

(C) conditions (which shall be consistent with the procedures and conditions established under subparagraph (A)), under which the accreditation of foreign laboratories by their governments or organizations recognized by the Director shall be deemed to satisfy the laboratory accreditation requirements of this section.

(2) Upon establishing a laboratory accreditation program under paragraph (1), the Secretary shall publish a notice in the Federal Register stating that the Secretary is prepared to accept applications for accreditation of such laboratories.

(3) No accreditation provided under the terms of this subsection shall be effective for a period of greater than 3 years.

(b) LABORATORY ACCREDITATION PROCEDURES. —Existing Institute accreditation procedures stated in part 7 of title 15, Code of Federal Regulations, as in effect on the date of enactment of this Act, supplemented as the Secretary considers necessary, shall be used to accredit laboratories under the accreditation program established under subsection (a).

(c) ENSURING COMPLIANCE. —(1) The Secretary shall ensure that—

(A) private entities accrediting laboratories under procedures and conditions established under subsection (a)(1)(B) comply with such procedures and conditions, and

(B) laboratories accredited by such private entities, or by foreign governments pursuant to subsection (a)(1)(C), comply with the requirements for such accreditation.

(2) The Secretary may require any such private entity or laboratory to provide all records and materials that may be necessary to allow the Secretary to carry out this subsection.

(d) OPERATION OF LABORATORY ACCREDITATION PROGRAM. —

(1) The Director may hire such contractors as are necessary to carry out the accreditation program established under subsection (a).

(2) Costs to the Institute and to the Secretary for the establishment and operation of the accreditation program under this section shall be fully reimbursable to the Institute or to the Secretary, as appropriate, through fees or other charges for accreditation services under such program.

(e) RECOMMENDATIONS TO CONSENSUS STANDARDS ORGANIZATIONS. —The Director shall periodically transmit to appropriate consensus standards organizations any information or recommendations that may be useful in the establishment or application by such organizations of standards and specifications for fasteners.

* * * * *

November 16, 1990, 104 Stat. 3231 (Public Law 101-614—101th Congress, 2d session) National Earthquake Hazards Reduction Program Reauthorization Act.

Public Law 101-614

AN ACT

To authorize appropriations for the Earthquake Hazards Reduction Act of 1977, and for other purposes.

SEC. 4. (1) (104 Stat. 3232) Definitions. ... "(7) The term 'Program agencies' means the Federal Emergency Management Agency, the United States Geological Survey, the National Science Foundation, and the National Institute of Standards and Technology."

SEC. 5. (b)(2)(A) (104 Stat. 3233) "(iii) prepare and disseminate widely, with the assistance of the National Institute of Standards and Technology, other Federal agencies, and private sector groups, information on building codes and practices for structures and lifelines;

SEC. 5. (b)(5) (104 Stat. 3236) National Institute of Standards and Technology.-The National Institute of Standards and Technology shall be responsible for carrying out research and development to improve building codes and standards and practices for structures and lifelines. In carrying out this paragraph, the Director of the National Institute of Standards and Technology shall—

(A) work closely with national standards and model building code organizations, in conjunction with the Agency, to promote the implementation of research results;

(B) promote better building practices among architects and engineers; and

(C) work closely with national standards organizations to develop seismic safety standards and practices for new and existing lifelines.

SEC. 8. (a)(1) (104 Stat. 3237-8) Adoption of Standards.

The President shall adopt, not later than December 1, 1994, standards for assessing and enhancing the seismic safety of existing buildings constructed for or leased by the Federal Government which were designed and constructed without adequate seismic design and construction standards. Such standards shall be developed by the Interagency Committee on Seismic Safety in Construction, whose chairman is the Director of the National Institute of Standards and Technology or his designee, and which shall work in consultation with appropriate private sector organizations. ...

(b) Lifelines.-The Director of the Agency, in consultation with the Director of the National Institute of Standards and Technology, shall submit to the Congress, not later that June 30, 1992, a plan, including precise timetables and budget estimates, for developing and adopting, in consultation with appropriate private sector organizations, design and construction standards for lifelines. The plan shall include recommendations of ways Federal regulatory authority could be used to expedite the implementation of such standards."

SEC. 11. (104 Stat. 3239) Post-Earthquake Investigations Program. ... The Director of the Survey is authorized to utilize earthquake expertise from the Agency, the National Science Foundation, the National Institute of Standards and Technology, other Federal agencies, and private contractors, on a reimbursable basis, in the conduct of such earthquake investigations. At a minimum, investigations under this section shall include—

(1) analysis by the National Science Foundation and the United States Geological Survey of the causes of the earthquake and the nature of the resulting ground motion;

(2) analysis by the National Science Foundation and the National Institute of Standards and Technology of the behavior of structures and lifelines, both those that were damaged and those that were undamaged; and ...

SEC. 14. (b) (104 Stat. 3242) Study on Improving Earthquake Mitigation.— ... The Director of the Federal Emergency Management Agency shall appoint, in consultation with the United States Geological Survey, the National Institute of Standards and Technology, and the National Science Foundation, a panel of experts in relevant fields and activities to undertake such study ...

* * * * *

December 9, 1991, 105 Stat. 1594 (Public Law 102-194—102nd Congress, 1st session) High-Performance Computing Act of 1991.

Public Law 102-194

AN ACT

To provide for a coordinated Federal program to ensure continued United States leadership in high-performance computing.

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

[*1] SECTION 1.

SHORT TITLE.

This Act may be cited as the "High-Performance Computing Act of 1991".

TITLE II—AGENCY ACTIVITIES

[*204] SEC. 204.

DEPARTMENT OF COMMERCE ACTIVITIES.

(a) General Responsibilities. As part of the Program described in title I—

(1) the National Institute of Standards and Technology shall—

(A) conduct basic and applied measurement research needed to support various high-performance computing systems and networks;

(B) develop and propose standards and guidelines, and develop measurement techniques and test methods, for the interoperability of high-performance computing systems in networks and for common user interfaces to systems; and

(C) be responsible for developing benchmark tests and standards for high-performance computing systems and software; and

(2) the National Oceanic and Atmospheric Administration shall conduct basic and applied research in weather prediction and ocean sciences, particularly in development of new forecast models, in computational fluid dynamics, and in the incorporation of evolving computer architectures and networks into the systems that carry out agency missions.

(b) High-Performance Computing and Network Security. Pursuant to the Computer Security Act of 1987 (Public Law 100-235; 101 Stat. 1724), the National Institute of Standards and Technology shall be responsible for developing and proposing standards and guidelines needed to assure the cost-effective security and privacy of sensitive information in Federal computer systems.

(c) Study of Impact of Federal Procurement Regulations.

(1) The Secretary of Commerce shall conduct a study to—

(A) evaluate the impact of Federal procurement regulations that require that contractors providing software to the Federal Government share the rights to proprietary software development tools that the contractors use to develop the software; and

(B) determine whether such regulations discourage development of improved software development tools and techniques.

(2) The Secretary of Commerce shall, within one year after the date of enactment of this Act, report to the Congress regarding the results of the study conducted under paragraph (1).

(d) Authorization of Appropriations. From sums otherwise authorized to be appropriated, there are authorized to be appropriated—

(1) to the National Institute of Standards and Technology for the purposes of the Program $3,000,000 for fiscal year 1992; $4,000,000 for fiscal year 1993; $5,000,000 for fiscal year 1994; $6,000,000 for fiscal year 1995; and $7,000,000 for fiscal year 1996; and

(2) to the National Oceanic and Atmospheric Administration for the purposes of the Program $2,500,000 for fiscal year 1992; $3,000,000 for fiscal year 1993; $3,500,000 for fiscal year 1994; $4,000,000 for fiscal year 1995; and $4,500,000 for fiscal year 1996. year 1994; $6,500,000 for fiscal year 1995; and $7,000,000 for fiscal year 1996. on $1,500,000 for fiscal year 1992; $1,700,000 for fiscal year 1993; $1,900,000 for fiscal year 1994; $2,100,000 for fiscal year 1995; and $2,300,000 for fiscal year 1996.

SEC. 208 FOSTERING UNITED STATES COMPETITIVENESS IN HIGH-PERFORMANCE COMPUTING AND RELATED ACTIVITIES.

(c) Review of Supercomputer Agreement.—

(1) Report. The Under Secretary for Technology Administration of the Department of Commerce (in this subsection referred to as the "Under Secretary") shall conduct a comprehensive study of the revised "Procedures to Introduce Supercomputers" and the accompanying exchange of letters between the United States and Japan dated June 15, 1990 (commonly referred to as the "Supercomputer Agreement") to determine whether the goals and objectives of such Agreement have been met and to analyze the effects of such Agreement on United States and Japanese supercomputer manufacturers. Within 180 days after the date of enactment of this Act, the Under Secretary shall submit a report to Congress containing the results of such study.

(2) Consultation. In conducting the comprehensive study under this subsection, the Under Secretary shall consult with appropriate Federal agencies and departments and with United States manufacturers of supercomputers and other appropriate private sector entities.

* * * * *

February 14, 1992, 106 Stat. 7 (Public Law 102-245—-102nd Congress, 2nd session) American Technology Preeminence Act of 1991.

Public Law 102-245

AN ACT

To authorize appropriations for the National Institute of Standards and Technology and the Technology Administration of the Department of Commerce, 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 "American Technology Preeminence Act of 1991".

TITLE I—DEPARTMENT OF COMMERCE RESEARCH AND TECHNOLOGY

SEC. 101.

SHORT TITLE.

This title may be cited as the "Technology Administration Authorization Act of 1991".

SEC. 102.

STATEMENT OF POLICY.

Congress finds that in order to help United States industries to speed the development of new products and processes so as to maintain the economic competitiveness of the Nation, it is necessary to strengthen the programs and activities of the Department of Commerce's Technology Administration and National Institute of Standards and Technology.

SEC. 104. NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

(a) Fiscal Year 1992.

(1) There are authorized to be appropriated to the Secretary, to carry out the intramural scientific and technical research and services activities of the Institute, $210,000,000 for fiscal year 1992, which shall be available for the following line items:

(A) Electronics and Electrical Measurements, $33,700,000.

(B) Manufacturing Engineering, $13,500,000.

(C) Chemical Science and Technology, $22,000,000.

(D) Physics, $27,000,000.

(E) Materials Science and Engineering, $30,000,000.

(F) Building and Fire Research, $12,300,000.

(G) Computer Systems, $16,000,000.

(H) Applied Mathematics and Scientific Computing, $6,500,000.

(I) Technology Assistance, $11,000,000.

(J) Research Support Activities, $38,000,000.

(2) (A) Of the total of the amounts authorized under paragraph (1), $2,000,000 are authorized only for steel technology.

(B) Of the amount authorized under paragraph (1)(I)—

(i) $500,000 are authorized only for the evaluation of nonenergy-related inventions and related technology extension activities;

(ii) $250,000 are authorized only for Institute participation in the pilot program established under subsection (e); and

(iii) $2,700,000 are authorized only for the Institute's management of the extramural funding programs authorized under section 105.

(C) Of the total amount authorized under paragraph (1)(J), $7,565,000 are authorized only for the technical competence fund.

(b) Fiscal Year 1993. (1) There are authorized to be appropriated to the Secretary, to carry out the intramural scientific and technical research and services activities of the Institute, $221,200,000 for fiscal year 1993, which shall be available for the following line items:

(A) Electronics and Electrical Measurements, $36,000,000.

(B) Manufacturing Engineering, $16,000,000.

(C) Chemical Science and Technology, $22,500,000.

(D) Physics, $28,700,000.

(E) Materials Science and Engineering, $39,400,000.

(F) Building and Fire Research, $12,000,000.

(G) Computer Systems, $20,600,000.

(H) Applied Mathematics and Scientific Computing, $6,300,000.

(I) Technology Assistance, $10,800,000.

(J) Research Support Activities, $25,000,000.

(K) Pay Raise, $3,900,000

(2) (A) Of the total of the amounts authorized under paragraph (1), $2,000,000 are authorized only for steel technology.

(B) Of the amount authorized under paragraph (1)(I)—

(i) $500,000 are authorized only for the evaluation of nonenergy-related inventions and related technology extension activities;

(ii) $250,000 are authorized only for Institute participation in the pilot program established under subsection (e); and

(iii) $5,000,000 are authorized only for the Institute's management of the extramural funding programs authorized under section 105.

(C) Of the total amount authorized under paragraph (1)(J), $7,223,000 are authorized only for the technical competence fund.

(3) In addition to the amounts authorized under paragraph (1), there are authorized to be appropriated to the Secretary for fiscal year 1993 $34,800,000 for the renovation and upgrading of the Institute's facilities.

(c) Transfers. (1) Funds may be transferred among the line items listed in subsection (a)(1) and among the line items listed in subsection (b)(1), so long as the net funds transferred to or from any line item do not exceed 10 percent of the amount authorized for that line item in such subsection and the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives are notified in advance of any such transfer.

(2) The Secretary may propose transfers to or from any line item listed in subsection (a)(1) or subsection (b)(1) exceeding 10 percent of the amount authorized for such line item, but such proposed transfer may not be made unless—

(A) a full and complete explanation of any such proposed transfer and the reason therefor are transmitted in writing to the Speaker of the House of Representatives, the President of the Senate, and the appropriate authorizing Committees of the House of Representatives and the Senate, and

(B) 30 calendar days have passed following the transmission of such written explanation.

(d) Relation to Other Authorizations. Except for authorizations provided in the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418; 102 Stat. 1448), the Earthquake Hazards Reduction Act of 1977 (42 U.S.C. 7701 et seq.), and the Steel and Aluminum Energy Conservation and Technology Competitiveness Act of 1988 (15 U.S.C. 5101 et seq.), this Act contains the complete authorizations of appropriations for the Institute for fiscal years 1992 and 1993. This subsection shall not limit the authority of the Institute to accept funds appropriated to any other Federal agency or to perform work for others.

(e) Pilot Program. Pursuant to the authorizations contained in subsections (a)(1)(I) and (b)(1)(I), the Secretary is authorized to pay the Federal share of the cost of establishing and carrying out a standards assistance pilot program under section 112 of the National Institute of Standards and Technology Authorization Act for Fiscal Year 1989 (15 U.S.C. 272 note). The purpose of the pilot program is to assist a country or countries that have requested assistance from the United States in the development of comprehensive industrial standards by providing the continuous presence of United States personnel on-site for a period of 2 or more years to provide such assistance and by providing, as necessary, additional technical support from within the Institute. Such funds shall be made available for such purpose only to the extent that matching funds are received by the National Institute of Standards and Technology from sources outside the Federal Government.

(f) Construction of Facilities. Section 14 of the National Institute of Standards and Technology Act (15 U.S.C. 278d) is amended by striking "herein:" and all that follows, and inserting in lieu thereof "herein.".

(g) Fire and Building Programs. The fire research and building technology programs of the Institute may be combined for administrative purposes only, and separate budget accounts for fire research and building technology shall be maintained. No later than December 31, 1992, the Secretary, acting through the Director of the Institute, shall report to Congress on the results of the combination, on efforts to preserve the integrity of the fire research and building technology programs, on the long-range basic and applied research plans of the two programs, on procedures for receiving advice on fire and earthquake research priorities from constituencies concerned with public safety, and on the relation between the combined program at the Institute and the United States Fire Administration.

(h) Educational Programs. (1) Section 18 of the National Institute of Standards and Technology Act (15 U.S.C. 278g-1) is amended by striking the period at the end of the first sentence and inserting in lieu thereof ", and to United States citizens for research and technical activities on Institute programs.".

(2) Section 17 of the National Institute of Standards and Technology Act (15 U.S.C. 278g) is amended by adding at the end the following new subsection:

"(d) For any scientific and engineering disciplines for which there is a shortage of suitably qualified and available United States citizens and nationals, the Secretary is authorized to recruit and employ in scientific and engineering fields at the Institute foreign nationals who have been lawfully admitted to the United States for permanent residence under the Immigration and Nationality Act and who intend to become United States citizens. Employment of a person under this paragraph shall not be subject to the provisions of title 5, United States Code, governing employment in the competitive service, or to any prohibition in any other Act against the employment of aliens, or against the payment of compensation to them.".

(i) Core Program Funding. It is the sense of the Congress that the intramural scientific and technical research and services activities of the National Institute of Standards and Technology should share fully in any funding increases provided to the Institute.

SEC. 105. EXTRAMURAL PROGRAMS OF THE INSTITUTE.

(a) Fiscal Year 1992. In addition to any sums otherwise authorized under this Act, there are authorized to be appropriated to the Secretary, to carry out the extramural industrial technology services programs of the Institute created under sections 25, 26, and 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278k, 278l, and 278n), $127,500,000 for fiscal year 1992, which shall be available for the following line items:

(1) Regional Centers for the Transfer of Manufacturing Technology, $25,000,000.

(2) State Technology Extension Program, $2,500,000.

(3) Advanced Technology Program, $100,000,000.

(b) Fiscal Year 1993. In addition to any sums otherwise authorized under this Act, there are authorized to be appropriated to the Secretary, to carry out the extramural industrial technology services programs of the Institute created under sections 25, 26, and 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278k, 278l, and 278n), $127,500,000 for fiscal year 1993, which shall be available for the following line items:

(1) Regional Centers for the Transfer of Manufacturing Technology and Satellite Manufacturing Centers, $25,000,000.

(2) State Technology Extension Program, $2,500,000.

(3) Advanced Technology Program, $100,000,000.

(c) Limitation. No funds are authorized under this section for any project under the extramural programs of the Institute which have not been competitively reviewed through the merit review processes required by the National Institute of Standards and Technology Act (15 U.S.C. 271 et seq.).

(d) Amendments to Extension Program. Section 5121(b) of the Omnibus Trade and Competitiveness Act of 1988 (15 U.S.C. 278l note) is amended by striking paragraph (5).

(e) Amendments to Extension Activities. (1) Section 25(c)(6) of the National Institute of Standards and Technology Act (15 U.S.C. 278k(c)(6)) is amended by inserting before the period at the end the following: "except for contracts for such specific technology extension or transfer services as may be specified by statute or by the Director".

(2) Section 25(d) of the National Institute of Standards and Technology Act (15 U.S.C. 278k(d)) is amended to read as follows:

"(d) In addition to such sums as may be authorized and appropriated to the Secretary and Director to operate the Centers program, the Secretary and Director also may accept funds from other Federal departments and agencies for the purpose of providing Federal funds to support Centers. Any Center which is supported with funds which originally came from other Federal departments and agencies shall be selected and operated according to the provisions of this section."

(f) Advisory Committee. Section 5142(f) of the Omnibus Trade and Competitiveness Act of 1988 (15 U.S.C. 4632(f)) is amended by striking "and 1990" and inserting in lieu thereof "1990, 1991, 1992, and 1993".

SEC. 110. REPORT ON FACILITIES NEEDS.

By March 1, 1992, the Director of the Institute shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a report on what renovations and upgrades of Institute facilities are necessary over the next decade. The report shall include a ranking of facilities needs in order of priority, an estimate of costs, and the Director's plan for meeting these needs.

TITLE II—ADVANCED TECHNOLOGY PROGRAM AMENDMENTS

SEC. 201. EMERGING TECHNOLOGIES RESEARCH AND DEVELOPMENT.

(a) Short Title. This title may be cited as the "Emerging Technologies and Advanced Technology Program Amendments Act of 1991".

(b) Findings and Purposes.

(1) The Congress finds that—

(A) technological innovation and its profitable inclusion in commercial products are critical components of the ability of the United States to raise the living standards of Americans and to compete in world markets;

(B) maintaining viable United States-based high technology industries is vital to both the national security and the economic well-being of the United States;

(C) the Department of Commerce has reported that the United States is losing or losing badly, relative to Japan and Europe, in many important emerging technologies and risks losing much of the $350,000,000,000 United States market and $1,000,000,000,000 world market expected to develop by the year 2000 for products based on emerging technologies;

(D) it is in the national interest for the Federal Government to encourage and, in selected cases, provide limited financial assistance to industry-led private sector efforts to increase research and development in economically critical areas of technology;

(E) joint ventures are a particularly effective and appropriate way to pool resources to conduct research that no single company is likely to undertake but which will create new generic technologies that will benefit an entire industry and the welfare of the Nation;

(F) it is vital that industry within the United States attain a leadership role and capability in development, design, and manufacturing in fields such as high-resolution information systems, advanced manufacturing, and advanced materials; and

(G) the Advanced Technology Program, established under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n), is the appropriate vehicle for the United States Government to provide limited assistance to joint development within the United States of new high technology capabilities in fields such as high-resolution information systems, advanced manufacturing technology, and advanced materials, and can help encourage United States industry to work together on problems of mutual concern.

(2) The purposes of this section are—

(A) to strengthen the Advanced Technology Program created under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n), and to provide improved guidelines for the allocation of Advanced Technology Program funds appropriated under the authorizations contained in section 105 of this Act;

(B) to promote and assist in the development of advanced technologies and the generic application of such technologies to civilian products, processes, and services;

(C) to improve the competitive position of United States industry by supporting industry-led research and development projects in areas of emerging technology which have substantial potential to advance the economic well-being and national security of the United States, such as high-resolution information systems, advanced manufacturing technology, and advanced materials; and

(D) to support projects that range from idea exploration to prototype development and address long-term, high-risk areas of technological research, development, and application that are not otherwise being adequately developed by the private sector, but are likely to yield important benefits to the Nation.

(c) Advanced Technology Program. (1) Section 28(a) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(a)), is amended by adding at the end the following new sentence: "In operating the Program, the Secretary and Director shall, as appropriate, be guided by the findings and recommendations of the Biennial National Critical Technology Reports prepared pursuant to section 603 of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6683)."

(2) Section 28(b)(1) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(b)(1)), is amended by inserting "industry-led" immediately after "aid".

(3) Section 28(b)(1)(B) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(b)(1)(B)), is amended by inserting "by means of grants, cooperative agreements, or contracts" immediately after "such joint ventures".

(4) Section 28(b)(2) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(b)(2)), is amended to read as follows:

"(2) provide grants to and enter into contracts and cooperative agreements with United States businesses (especially small businesses), provided that emphasis is placed on applying the Institute's research, research techniques, and expertise to those organizations' research programs;".

(5) Section 28(d)(2) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(d)(2)) is amended to read as follows:

"(2) In the case of joint ventures, the Program shall not make an award unless the award will facilitate the formation of a joint venture or the initiation of a new research and development project by an existing joint venture.".

(6) Section 28(d) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(d)(7)) is amended—

(A) by striking paragraph (7);

(B) by redesignating paragraphs (8) and (9) as paragraphs (7) and (8), respectively; and

(C) by adding at the end the following new paragraphs:

"(9) A company shall be eligible to receive financial assistance under this section only if—

"(A) the Secretary finds that the company's participation in the Program would be in the economic interest of the United States, as evidenced by investments in the United States in research, development, and manufacturing (including, for example, the manufacture of major components or subassemblies in the United States); significant contributions to employment in the United States; and agreement with respect to any technology arising from assistance provided under this section to promote the manufacture within the United States of products resulting from that technology (taking into account the goals of promoting the competitiveness of United States industry), and to procure parts and materials from competitive suppliers; and

"(B) either—

"(i) the company is a United States-owned company; or

"(ii) the Secretary finds that the company is incorporated in the United States and has a parent company which is incorporated in a country which affords to United States-owned companies opportunities, comparable to those afforded to any other company, to participate in any joint venture similar to those authorized under this Act; affords to United States-owned companies local investment opportunities comparable to those afforded to any other company; and affords adequate and effective protection for the intellectual property rights of United States-owned companies.

"(10) Grants, contracts, and cooperative assignments under this section shall be designed to support projects which are high risk and which have the potential for eventual substantial widespread commercial application. In order to receive a grant, contract, or cooperative agreement under this section, a research and development entity shall demonstrate to the Secretary the requisite ability in research and technology development and management in the project area in which the grant, contract, or cooperative agreement is being sought.

"(11)(A) Title to any intellectual property arising from assistance provided under this section shall vest in a company or companies incorporated in the United States. The United States may reserve a nonexclusive, nontransferable, irrevocable paid-up license, to have practiced for or on behalf of the United States, in connection with any such intellectual property, but shall not, in the exercise of such license, publicly disclose proprietary information related to the license. Title to any such intellectual property shall not be transferred or passed, except to a company incorporated in the United States, until the expiration of the first patent obtained in connection with such intellectual property.

"(B) For purposes of this paragraph, the term 'intellectual property' means an invention patentable under title 35, United States Code, or any patent on such an invention.

"(C) Nothing in this paragraph shall be construed to prohibit the licensing to any company of intellectual property rights arising from assistance provided under this section."

(7) Section 28(e) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(e)) is amended to read as follows:

"(e) The Secretary may, within 30 days after notice to Congress, suspend a company or joint venture from continued assistance under this section if the Secretary determines that the company, the country of incorporation of the company or a parent company, or the joint venture has failed to satisfy any of the criteria set forth in subsection (d)(9), and that it is in the national interest of the United States to do so."

(8) Section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n) is amended by adding at the end the following new subsections:

"(f) When reviewing private sector requests for awards under the Program, and when monitoring the progress of assisted research projects, the Secretary and the Director shall, as appropriate, coordinate with the Secretary of Defense and other senior Federal officials to ensure cooperation and coordination in Federal technology programs and to avoid unnecessary duplication of effort. The Secretary and the Director are authorized to work with the Director of the Office of Science and Technology Policy, the Secretary of Defense, and other appropriate Federal officials to form interagency working groups or special project offices to coordinate Federal technology activities.

"(g) In order to analyze the need for the value of joint ventures and other research projects in specific technical fields, to evaluate any proposal made by a joint venture or company requesting the Secretary's assistance, or to monitor the progress of any joint venture or any company research project which receives Federal funds under the Program, the Secretary, the Under Secretary of Commerce for Technology, and the Director may, notwithstanding any other provision of law, meet with such industry sources as they consider useful and appropriate.

"(h) Up to 10 percent of the funds appropriated for carrying out this section may be used for standards development and technical activities by the Institute in support of the purposes of this section.

"(i) In addition to such sums as may be authorized and appropriated to the Secretary and Director to operate the Program, the Secretary and Director also may accept funds from other Federal departments and agencies for the purpose of providing Federal funds to support awards under the Program. Any Program award which is supported with funds which originally came from other Federal departments and agencies shall be selected and carried out according to the provisions of this section.

"(j) As used in this section—

"(1) the term 'joint venture' means any group of activities, including attempting to make, making, or performing a contract, by two or more persons for the purpose of—

"(A) theoretical analysis, experimentation, or systematic study of phenomena or observable facts;

"(B) the development or testing of basic engineering techniques;

"(C) the extension of investigative finding or theory of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, prototypes, equipment, materials, and processes;

"(D) the collection, exchange, and analysis of research information;

"(E) the production of any product, process, or service; or

"(F) any combination of the purposes specified in subparagraphs (A), (B), (C), (D), and (E), and may include the establishment and operation of facilities for the conducting of research, the conducting of such venture on a protected and proprietary basis, and the prosecuting of applications for patents and the granting of licenses for the results of such venture; and

"(2) the term 'United States-owned company' means a company that has majority ownership or control by individuals who are citizens of the United States."

(d) Effective Date. The amendments in subsection (c) shall take effect immediately upon enactment; however, the amendments shall not apply to applications submitted before the date of enactment of this Act.

(e) Management Costs. Section 2 of the National Institute of Standards and Technology Act (15 U.S.C. 272) is amended by adding at the end thereof the following new subsection:

"(d) In carrying out the extramural funding programs of the Institute, including the programs established under sections 25, 26, and 28 of this Act, the Secretary may retain reasonable amounts of any funds appropriated pursuant to authorizations for these programs in order to pay for the Institute's management of these programs."

(f) Comprehensive Report. The Secretary shall, not later than 4 years after the date of enactment of this Act, submit to each House of the Congress and the President a comprehensive report on the results of the Advanced Technology Program established under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n), including any activities in the areas of high-resolution information systems, advanced manufacturing technology, and advanced materials.

SEC. 303. RESEARCH EQUIPMENT.

Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710) is amended by adding at the end the following new subsection:

"(i) Research Equipment. The Director of a laboratory, or the head of any Federal agency or department, may give research equipment that is excess to the needs of the laboratory, agency, or department to an educational institution or nonprofit organization for the conduct of technical and scientific education and research activities. Title of ownership shall transfer with a gift under the section."

TITLE V—STUDIES AND REPORTS

SEC. 507. NATIONAL QUALITY COUNCIL.

(a) Establishment and Functions. There is established a National Quality Council (hereafter in this section referred to as the "Council")...

(b) Membership. The Council shall consist of not less than 17 or more than 20 members, appointed by the Secretary. Members shall include ...

(9) one representative from the National Institute of Standards and Technology; ...

(12) one representative from the Foundation for the Malcolm Baldrige National Quality Award...

* * * * *

October 26, 1992, 106 Stat. 3410 (Public Law 102-522—102 Congress, 2d session) Fire Administration Authorization Act of 1992.

Public Law 102-522

AN ACT

To authorize appropriations for activities under the Federal Fire Prevention and Control Act of 1974, and for other purposes.

SEC. 106. (a) (106 Stat. 3416) Amendment.—"

(d) Regulations.—

The Administrator of General Services, in cooperation with the United States Fire Administration, the National Institute of Standards and Technology, and the Department of Defense, within 2 years after the date of enactment of this section, shall promulgate regulations to further define the term 'equivalent level of safety', and shall, to the extent practicable, base those regulations on nationally recognized codes.

* * * * *

APPENDIX B

HISTORIES OF THE NATIONAL BUREAU OF STANDARDS

1. War Work of the Bureau of Standards. Miscellaneous Publication No. 46

Anonymous
US Government Printing Office,-1921
299 pp.

Table of Contents (There are no chapters, only topics listed in alphabetical order. No Bureau employees' names are mentioned.)

Aeronautic instruments; Aeronautic power plants; Aircraft construction; Aircraft materials; Aircraft (miscellaneous); Airplane dopes; Balloon gases; Calibration of testing machines; Chemical investigations (miscellaneous); Chromatic camouflage and chromatically concealed insignia; Coke-oven investigations; Concrete and cement; Concrete ships; Electric batteries; Electric blasting apparatus; Electric tractors and trucks; Electrical inductance method for location of metal bodies; Gages, precision; Illuminating engineering; Inks and ink powders; Invisible signaling; Invisible writing, means for the detection of; Leather; Magnetic investigations; Manilla rope; Medical supplies; Metallurgical investigations; Physical tests of metals and metal structures; Natural-gas investigations; Optical glass and optical instruments; Ordnance; Paper; Photography; Protective coatings; Publications and information; Radio communications; Radiometry; Radium; Rope, manila; Rubber; Safety standards for military industrial establishments; Searchlights; Sound-ranging apparatus; Sounds transmitted through the earth; Submarine detection; Telephone problems; Testing machines, calibration of; Textiles; Timepieces; Toloul recovery; Wheels, investigation of artillery, truck, and airplane; X-rays.

No **Index** was included with the text.

2. The Bureau of Standards: Its History, Activities, and Organization

Gustavus A. Weber
Johns Hopkins Press, 1925
299 pp.

Table of Contents

1. History (70 pp.)
2. Activities (120 pp.)
3. Organization (20 pp.)

Appendices

1. Outline of Organization (15 pp.)
2. Classification of Activities (4 pp.)
3. Publications (4 pp.)
4. Equipment (2 pp.)
5. Laws (16 pp.)
6. Financial Statement (12 pp.)
7. Bibliography (12 pp.)

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3. NBS War Research—The National Bureau of Standards in World War II

Lyman J. Briggs, Director Emeritus, NBS
U.S. Government Printing Office, September 1949
187 pp.

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Appendix

No **Index** was included with the text.

4. The Story of Standards

John Perry
Funk & Wagnalls, 1955
271 pp.

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5. Measures For Progress: A History of the National Bureau of Standards

Rexmond C. Cochrane
NBS Miscellaneous Publication 275, US Government Printing Office, 1966.
703 pp.

Table of Contents

Appendices

6. Achievement in Radio: Seventy Years of Radio Science, Technology, Standards, and Measurement at the National Bureau of Standards

Wilbert F. Snyder and Charles L. Bragaw
NBS Special Publication 555, US Government Printing Office, October 1986
842 pp.

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7. A Unique Institution: The National Bureau of Standards, 1950-1969

Elio Passaglia, with Karma A. Beal
NBS Special Publication 925, US Government Printing Office, 1999
822 pp.

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Appendices

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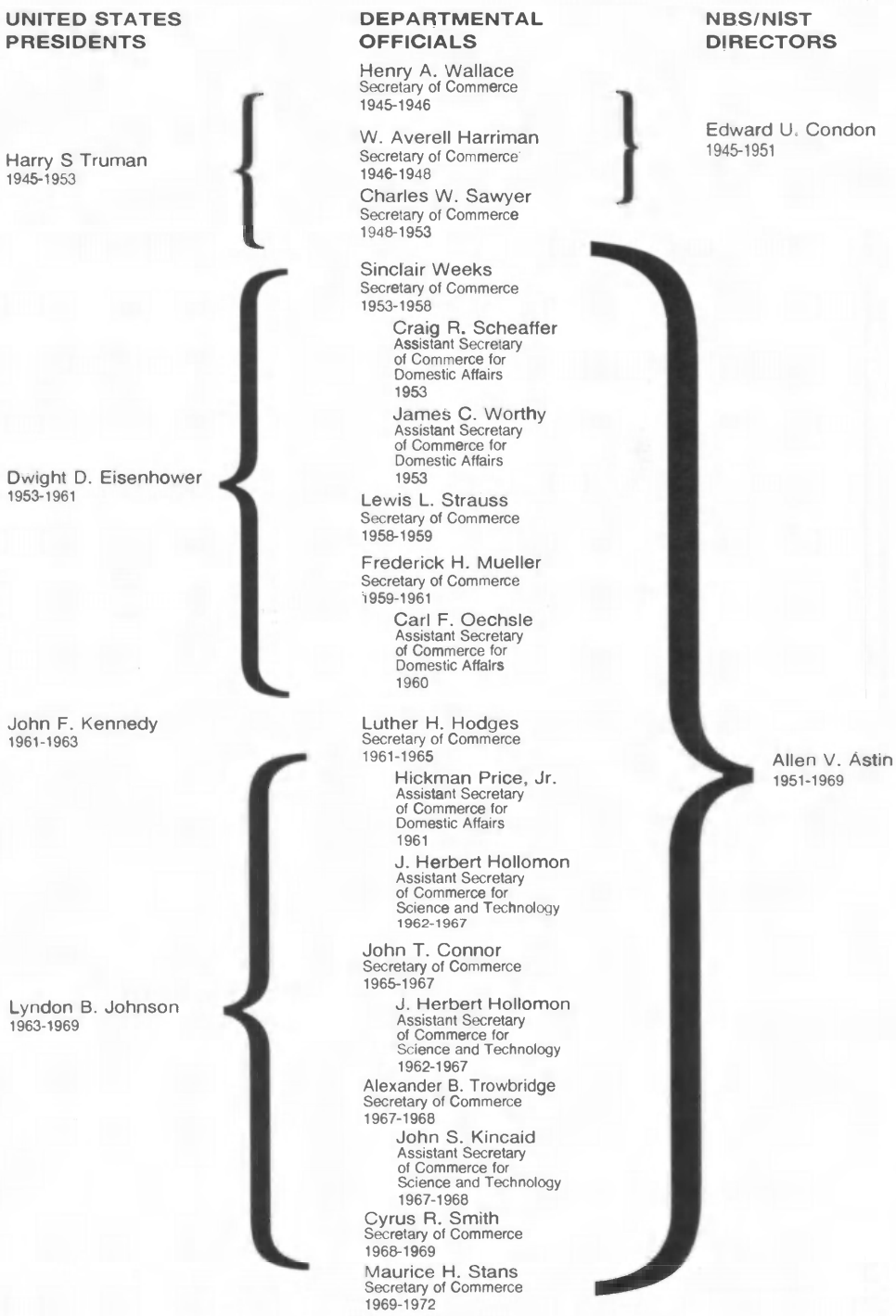
APPENDIX C

NBS/NIST IN THE FEDERAL ADMINISTRATION

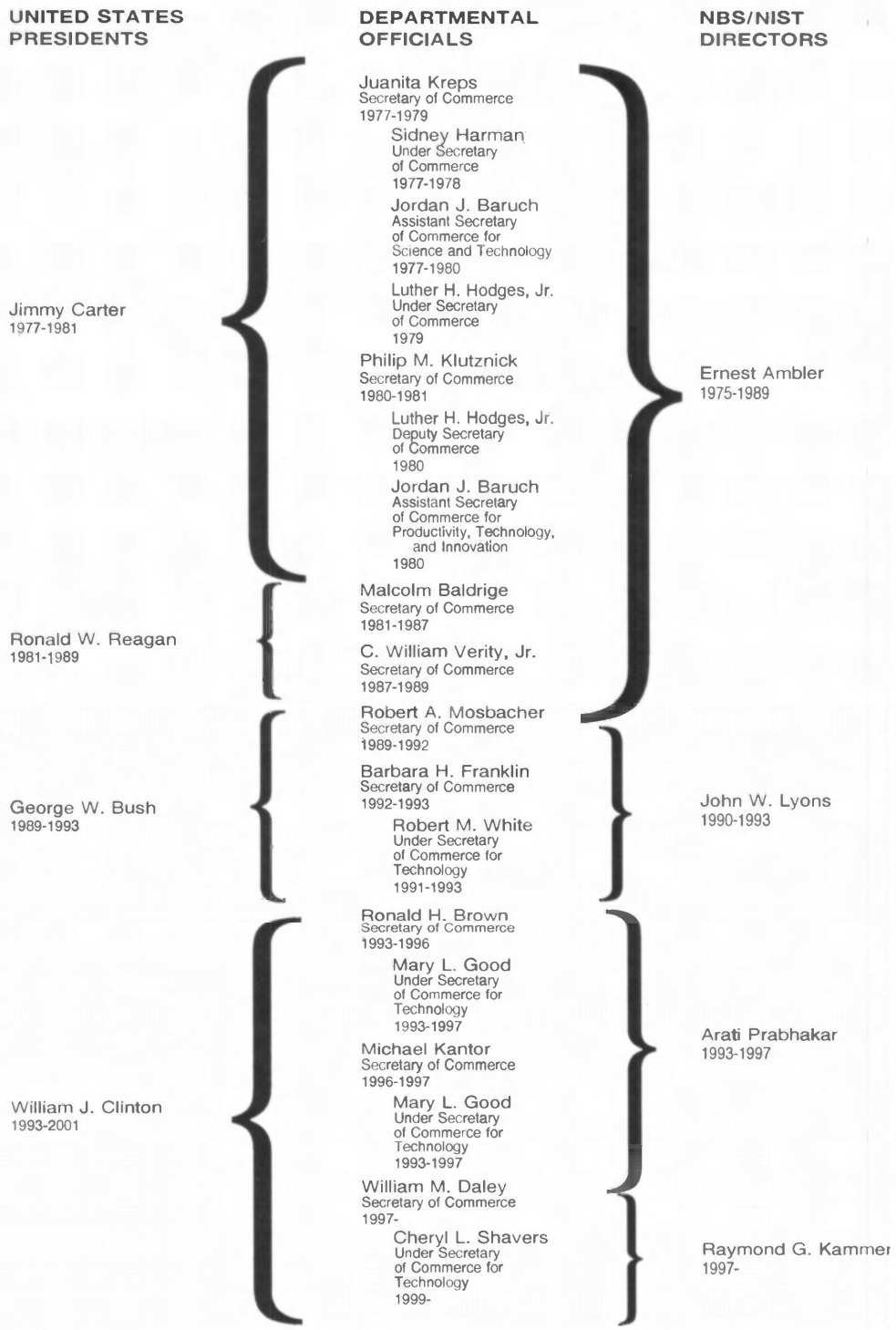
Supervisory Chain Above NBS. In this appendix, we list Executive departmental officials who exercised supervisory authority over NBS/NIST. Beginning with the appointment of Craig R. Scheaffer as Assistant Secretary of Commerce for Domestic Affairs under Sinclair Weeks, the Secretary of Commerce frequently appointed a subordinate who bore such a responsibility.

The dates of service of NBS/NIST directors include periods served as Acting Director by Briggs, Astin, Ambler, and Kammer.

UNITED STATES PRESIDENTS	DEPARTMENTAL OFFICIALS	NBS/NIST DIRECTORS
William McKinley 1897-1901	Lyman J. Gage Secretary of the Treasury 1897-1902	
	Leslie M. Shaw Secretary of the Treasury 1902-1907	
	George B. Cortelyou Secretary of Commerce and Labor 1903-1904	
Theodore Roosevelt 1901-1909	Victor H. Metcalf Secretary of Commerce and Labor 1904-1906	
	Oscar S. Strauss Secretary of Commerce and Labor 1906-1909	Samuel W. Stratton 1901-1922
William H. Taft 1909-1913	Charles Nagel Secretary of Commerce and Labor 1909-1913	
	William C. Redfield Secretary of Commerce 1913-1919	
Woodrow Wilson 1913-1921	Joshua W. Alexander Secretary of Commerce 1919-1921	
Warren G. Harding 1921-1923	Herbert C. Hoover Secretary of Commerce 1921-1928	
Calvin Coolidge 1923-1929	William F. Whiting Secretary of Commerce 1928-1929	George K. Burgess 1923-1932
	Robert P. Lamont Secretary of Commerce 1929-1932	
Herbert C. Hoover 1929-1933	Roy D. Chapin Secretary of Commerce 1932-1933	
	Daniel C. Roper Secretary of Commerce 1933-1938	Lyman J. Briggs 1932-1945
	Harry L. Hopkins Secretary of Commerce 1938-1940	
Franklin D. Roosevelt 1933-1945	Jesse H. Jones Secretary of Commerce 1940-1945	
	Henry A. Wallace Secretary of Commerce 1945-46	


UNITED STATES PRESIDENTS
DEPARTMENTAL OFFICIALS
NBS/NIST DIRECTORS
Harry S Truman
1945-1953
Henry A. Wallace
Secretary of Commerce
1945-1946
W. Averell Harriman
Secretary of Commerce
1946-1948
Charles W. Sawyer
Secretary of Commerce
1948-1953
Edward U. Condon
1945-1951
Dwight D. Eisenhower
1953-1961
Sinclair Weeks
Secretary of Commerce
1953-1958
Craig R. Scheaffer
Assistant Secretary of Commerce for Domestic Affairs
1953
James C. Worthy
Assistant Secretary of Commerce for Domestic Affairs
1953
Lewis L. Strauss
Secretary of Commerce
1958-1959
Frederick H. Mueller
Secretary of Commerce
1959-1961
Carl F. Oechsle
Assistant Secretary of Commerce for Domestic Affairs
1960
John F. Kennedy
1961-1963
Luther H. Hodges
Secretary of Commerce
1961-1965
Hickman Price, Jr.
Assistant Secretary of Commerce for Domestic Affairs
1961
J. Herbert Hollomon
Assistant Secretary of Commerce for Science and Technology
1962-1967
Allen V. Astin
1951-1969
Lyndon B. Johnson
1963-1969
John T. Connor
Secretary of Commerce
1965-1967
J. Herbert Hollomon
Assistant Secretary of Commerce for Science and Technology
1962-1967
Alexander B. Trowbridge
Secretary of Commerce
1967-1968
John S. Kincaid
Assistant Secretary of Commerce for Science and Technology
1967-1968
Cyrus R. Smith
Secretary of Commerce
1968-1969
Maurice H. Stans
Secretary of Commerce
1969-1972

UNITED STATES PRESIDENTS	DEPARTMENTAL OFFICIALS	NBS/NIST DIRECTORS
Richard M. Nixon 1969-1974	Maurice H. Stans Secretary of Commerce 1969-1972	Lewis M. Branscomb 1969-1972
	Myron Tribus Assistant Secretary of Commerce for Science and Technology 1969-1970	
	Rocco C. Siciliano Under Secretary of Commerce 1970-1971	
	James H. Wakelin, Jr. Assistant Secretary of Commerce for Science and Technology 1971-1972	
	Peter G. Peterson Secretary of Commerce 1972-1973	
	James H. Wakelin, Jr. Assistant Secretary of Commerce for Science and Technology 1971-1972	
	Frederick B. Dent Secretary of Commerce 1973-1975	Richard W. Roberts 1973-1975
	Betsy Ancker-Johnson Assistant Secretary of Commerce for Science and Technology 1973-1977	
Gerald R. Ford 1974-1977	Rogers C. B. Morton Secretary of Commerce 1975-1976	Ernest Ambler 1975-1989
	James A. Baker, III Under Secretary of Commerce 1975-1976	
	Betsy Ancker-Johnson Assistant Secretary of Commerce for Science and Technology 1973-1977	
	Elliot L. Richardson Secretary of Commerce 1976-1977	
	Edward O. Vetter Under Secretary of Commerce 1976-1977	
	Betsy Ancker-Johnson Assistant Secretary of Commerce for Science and Technology 1973-1977	


UNITED STATES PRESIDENTS
DEPARTMENTAL OFFICIALS
NBS/NIST DIRECTORS
Jimmy Carter
1977-1981
Ronald W. Reagan
1981-1989
George W. Bush
1989-1993
William J. Clinton
1993-2001
Juanita Kreps
Secretary of Commerce
1977-1979
Sidney Harman
Under Secretary of Commerce
1977-1978
Jordan J. Baruch
Assistant Secretary of Commerce for Science and Technology
1977-1980
Luther H. Hodges, Jr.
Under Secretary of Commerce
1979
Philip M. Klutznick
Secretary of Commerce
1980-1981
Luther H. Hodges, Jr.
Deputy Secretary of Commerce
1980
Jordan J. Baruch
Assistant Secretary of Commerce for Productivity, Technology, and Innovation
1980
Malcolm Baldrige
Secretary of Commerce
1981-1987
C. William Verity, Jr.
Secretary of Commerce
1987-1989
Robert A. Mosbacher
Secretary of Commerce
1989-1992
Barbara H. Franklin
Secretary of Commerce
1992-1993
Robert M. White
Under Secretary of Commerce for Technology
1991-1993
Ronald H. Brown
Secretary of Commerce
1993-1996
Mary L. Good
Under Secretary of Commerce for Technology
1993-1997
Michael Kantor
Secretary of Commerce
1996-1997
Mary L. Good
Under Secretary of Commerce for Technology
1993-1997
William M. Daley
Secretary of Commerce
1997-
Cheryl L. Shavers
Under Secretary of Commerce for Technology
1999-
Ernest Ambler
1975-1989
John W. Lyons
1990-1993
Arati Prabhakar
1993-1997
Raymond G. Kammer
1997-

APPENDIX D

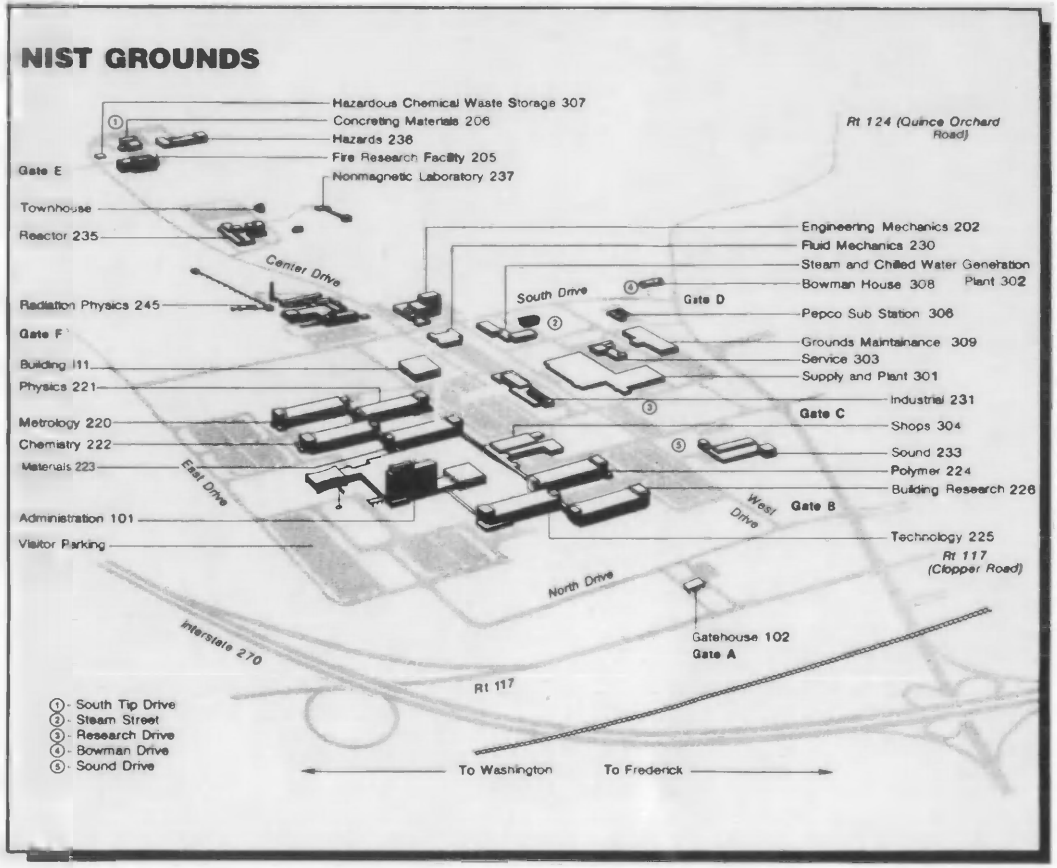
SITE INFORMATION AND MAPS
GAITHERSBURG AND BOULDER

CONSTRUCTION SCHEDULE FOR BUILDINGS AND SERVICE STRUCTURES ON THE NBS/NIST GAITHERSBURG SITE AS OF 1990

Building Number	Building Name	Date Begun	Date Completed	Date Occupied**	Area*
101	Administration	6-18-62	7-12-65	7-12-65	202.4
102	Gate House	5-1-69	3-1-70	2-19-70	.1
202	Engineering Mechanics	7-19-61	10-1-63	6-1-63	46.1
205	Fire Research	10-1-73	10-1-75	4-15-74	12.5
206	Concreting Materials	3-1-66	3-1-68	3-1-68	5.4
220	Metrology	8-21-63	2-14-66	2-14-66	109.1
221	Physics	8-21-63	3-28-66	3-28-66	111.5
222	Chemistry	8-21-63	2-28-66	2-28-66	79.5
223	Materials	8-21-63	4-27-66	4-27-66	78.1
224	Polymers	8-21-63	6-6-66	6-6-66	78.6
225	Instrumentation	8-21-63	8-3-66	8-3-66	104.6
226	Building Research	8-21-63	10-3-66	9-8-66	64.4
230	Fluid Mechanics	6-1-67	6-1-69	6-1-69	50.1
231	Industrial	2-8-66	2-8-68	2-8-68	40.6
233	Sound	9-20-65	2-27-68	2-27-68	21.2
235	Reactor	4-25-63	8-23-65	8-23-65	61.1
236	Hazards	4-15-66	4-15-68	5-15-68	6.5
237, 238	Non-Magnetic	6-3-64	2-14-68	2-14-68	4.4
245	Radiation	6-18-62	8-20-65	4-15-64	88.1
301	Supply and Plant	6-18-62	10-15-64	10-15-64	103.8
302	Steam and Chilled Water Generating Plant	7-19-61	7-21-64	4-1-63	27.6
303	Service	6-18-62	5-4-64	5-4-64	12.3
304	Instrument	6-18-62	12-4-64	12-4-64	53.6
305	Cooling Tower	7-19-61	7-21-64	------	------
306	Electrical Substation	7-19-61	1-2-64	4-1-63	------
307	Chemical Waste	12-1-70	5-1-71	1-6-72	.3
308	Bowman House	~1952	~1953	5-15-69	3.8
309	Grounds	10-1-74	10-1-76	4-24-75	8.9
310	Hazardous Materials Storage	10-1-86	1-1-87	------	------
411	Temporary Relocatable Facility	1-1-89	2-1-90	9-1-89	8.0
Total available area*					1,382.5

Area, Main Gaithersburg site = 575 acres. Acquired 1958 to 1970.
Area, Nike site = 13.7 acres. Acquired 1975.
Notes: Dates are coded month-day-year.
*Units: Thousands of square feet.
**Date occupied by NBS scientists.

Source: Plant Division, NIST, February 6, 1990


NIST GROUNDS
Hazardous Chemical Waste Storage 307
Concreting Materials 206
Hazards 236
Fire Research Facility 205
Nonmagnetic Laboratory 237
Rt 124 (Quince Orchard Road)
Gate E
Townhouse
Reactor 235
Center Drive
Radiation Physics 245
Gate F
Building 111
Physics 221
Metrology 220
Chemistry 222
Materials 223
East Drive
Administration 101
Visitor Parking
Engineering Mechanics 202
Fluid Mechanics 230
Steam and Chilled Water Generation Plant 302
Bowman House 308
South Drive
Gate D
Pepco Sub Station 306
Grounds Maintainance 309
Service 303
Supply and Plant 301
Industrial 231
Gate C
Shops 304
Sound 233
Polymer 224
Building Research 226
West Drive
Gate B
Technology 225
Rt 117 (Clopper Road)
North Drive
Gatehouse 102
Gate A
Interstate 270
Rt 117
① South Tip Drive
② Steam Street
③ Research Drive
④ Bowman Drive
⑤ Sound Drive
To Washington
To Frederick

BUILDINGS AND STRUCTURES OF THE NATIONAL BUREAU OF STANDARDS

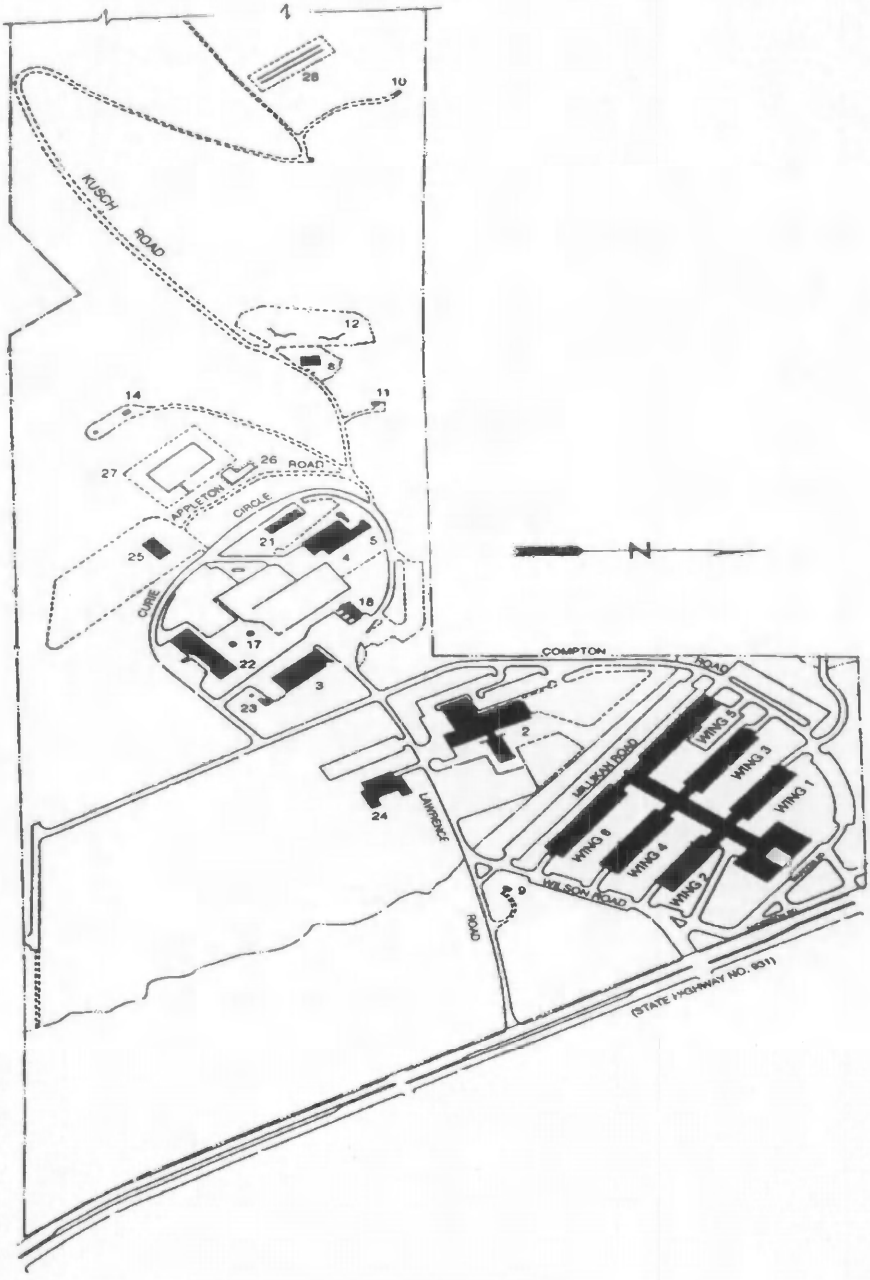
BOULDER, COLORADO

1970

Building*	Name	Date (in operation)	Assignable Square Feet
B1	Radio Building: Library, Auditorium, Center Spine, Wing 1, Wing 2, Wing 3, Wing 4	1954	200,257
B1	Wing 5	1962	77,928
B1	Wing 6	1959	26,000
B2	Cryogenics, South and North Half	1952	45,702
B2	Cryogenics, Wing "B"	1962	9,800
B3	Liquefier	1952	20,024
B4	Camco	1951	15,403
B5	Heavy Equipment	1951	2,850
B8	Cryogenic Mesa Test Site	1953	2,400
B9	Gas Meter	1958	312
B10	Green Mountain Antenna Building	1958-1973	209
B11	Vertical Incidence	1958	408
B14	Field Strength Calibration	1958	278
B17	Hydrogen Storage Tanks		
B18	Tube Tanks (Hydrogen) Storage		
B21	Maintenance Garage	1963	3,968
B22	Warehouse	1964	17,280
B23	Cooling Tower	1957-1989	312
B24	Plasma Physics[1]	1967	27,328
B25	North Shop	1966	3,200
B26	Ground Scanner Site		
B27	High Frequency Field Site		
B28	Microwave Antenna Range		
TOTAL			453,659

* Building numbers appear on site map, next page
Main Site Land: 217 acres
Date Acquired: June 14, 1950

[1] Used by the Environmental Science Services Administration.


1
28
10
KUSCH ROAD
12
14
11
27
26
ROAD
APPLETON
CIRCLE
21
4
5
25
CURIE
18
17
22
3
23
24
N
COMPTON
ROAD
2
WILSON ROAD
WING 5
WING 3
WING 1
WING 6
WING 4
WING 2
WILSON ROAD
LAWRENCE
ROAD
(STATE HIGHWAY NO. 631)

APPENDIX E

NBS/NIST STAFF, 1901-1999

The accompanying graph shows the growth (and decline!) of the staff of NBS/NIST over the first century of its existence. The personnel statistic most readily available over that period was "total staff," a term that often, but not always, included the following types of workers:

- Full-time permanent employees of NBS/NIST.
- Part-time paid employees, including summer students and other student-program paid personnel, intermittent employees, and temporary employees.
- Postdoctoral Research Associates.
- Paid consultants.
- Industrial Research Associates.
- Guest Workers, both American and foreign.

The chart shows three major peaks in NBS employment, and three declines as well. The peaks reflected intense participation by the Bureau in technical work connected with World War I (1914-1919), World War II (1939-1945), and the Cold War that followed WW II. Declines in NBS employment occurred during the Great Depression of 1929-1939, as a result of transferring to the Department of Defense in 1954 the wartime Bureau programs in proximity fuze research and guided missile research, and, from 1965 to 1985, accompanying a nation-wide weakening in support for scientific research.

It is clear that, despite the many changes wrought in 1988 by Public Law 100-418, the transition from NBS to NIST had no substantial impact on the overall staffing level of the agency.

Available data on full-time permanent employment at NBS/NIST are shown by the lower curves on the chart. In June 1968, a fairly typical year, *NBS Special Publication 308* contained the following breakdown of NBS staff:

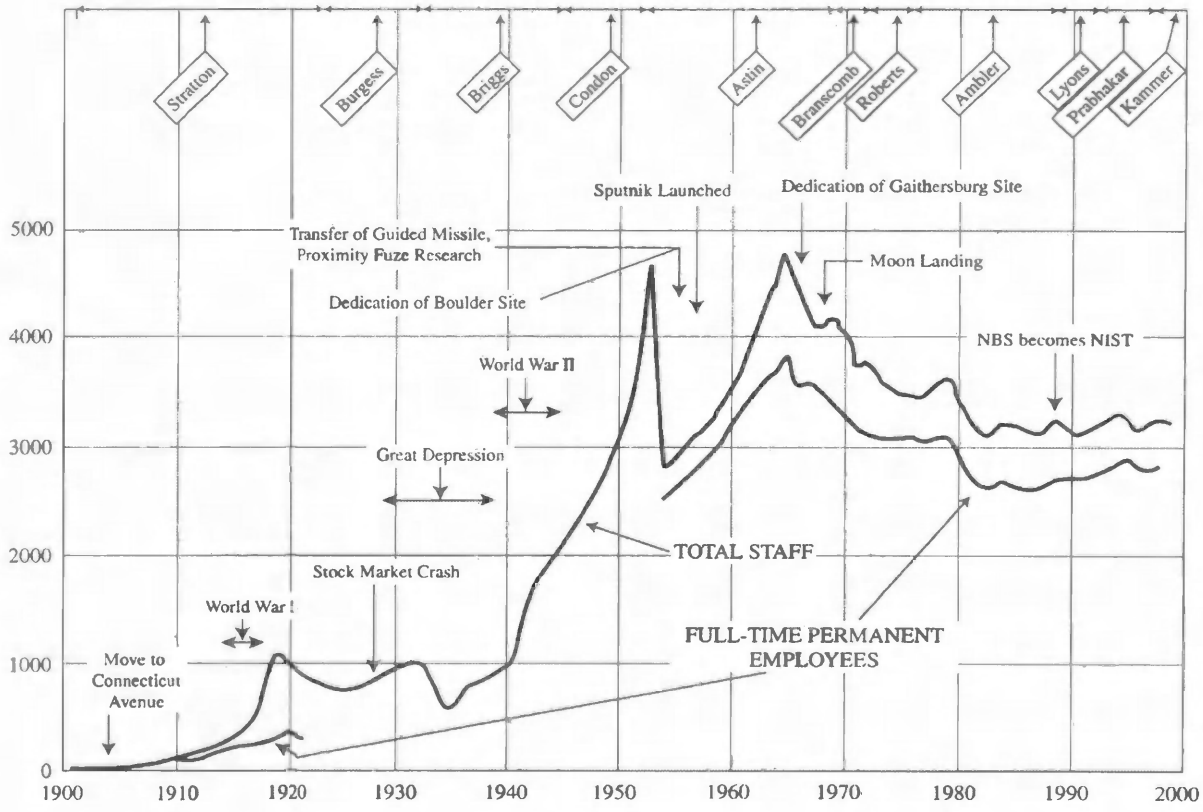
- Full-time permanent, Gaithersburg, including postdoctorals: 2,939.
- Full-time permanent, Boulder, including postdoctorals: 580.
- Other paid staff, Gaithersburg: 305.
- Other paid staff, Boulder: 48.
- Research associates and guest workers, Gaithersburg: 131.
- Research associates and guest workers, Boulder: 16.

Physicists comprised the largest single component of the Bureau professional staff in 1968, numbering 509. Chemists and engineers numbered 279 and 261, respectively. There were 56 mathematicians and 133 professionals of other types. The total number of staff members holding post-graduate degrees—1,238—represented nearly one-third of the total paid staff of NBS.

Also indicated on the graph are the periods of service of the 11 Directors of NBS/NIST and the dates of historical events that had significant impacts on the agency.

Sources: Susan Makar, Office of Information Services. Gail K. Ehrlich, Program Office.

NBS/NIST STAFF 1901-1999



APPENDIX F

NBS/NIST POSTDOCTORAL RESEARCH ASSOCIATES, 1968-1993

Associates were selected by panels of the National Academy of Science and the National Academy of Engineering. The program was administered by the National Research Council.

Name	University	NBS/NIST Advisor
1968		
Donald W. Alderman	Cornell U.	Robert J. Mahler
Michael J. Bielefeld	U. of Pennsylvania	Jon Spijkerman
Edith F. Borie	U. of North Carolina	Leonard Maximon
Arnold M. Denenstein	U. of Pennsylvania	Chester H. Page
Gabriel L. Epstein	U. of California/Berkeley	Joseph Reader
Benjamin Gibson	Stanford U.	Michael Danos
Roger A. Hegstrom	Harvard U.	Jon H. Shirley and Richard P. Reed
John W. Knoeck	Iowa State U.	John K. Taylor
Hassell M. Ledbetter	U. of Illinois	Richard P. Reed
William R. Ott	U. of Pittsburgh	Wolfgang L. Wiese
Stephen J. Pierce	U. of California/Santa Barbara	Morris Newman
LeRoy W. Schroeder	Northwestern U.	John J. Rush
Stuart K. Searles	U. of Alberta, Canada	Pierre Ausloos
Stanley E. Stokowski	Stanford U.	Ludwig H. Grabner
Donald D. Thornton	Syracuse U.	Billy W. Mangum
Edward F. Zalewski	U. of Chicago	Richard A. Keller
1969		
Gordon W. Day	U. of Illinois	Lawrence M. Matarrese
William L. Greer	U. of Chicago	Robert J. Rubin
Larry Handy	U. of Wisconsin	Frederick E. Brinckman
Max A. Haney	Rice U.	Thomas C. Farrar
William M. Haynes	U. of Virginia	Dwain E. Diller
Elizabeth J. Jacob	U. of Michigan	David R. Lide, Jr.
Paul S. Julienne	U. of North Carolina	Frederick H. Mies
Ernest G. Kessler	U. of Wisconsin	William C. Martin
Carl A. Kocher	Massachusetts Institute of Technology	Richard H. Kropschot
David E. Kranbuehl	U. of Wisconsin	Peter H. Verdier
Michael J. Kurylo, III	Catholic U. of America	Walter Braun
Russell L. Merris	U. of California/Santa Barbara	Morris Newman
William C. Mitchell	Washington University	Baldwin Robertson
Rogers W. Redding	Vanderbilt U.	Jon T. Hougen
Gregory J. Rosasco	Fordham U.	Hans P.R. Frederikse
Isaac C. Sanchez	U. of Delaware	Edmund A. DiMarzio
Carl C. Semmelroth	U. of Michigan	Isadore Nimeroff
Kenneth G. Sharp	Rice U.	Thomas D. Coyle
Selden L. Stewart	U. of Texas	Stephen J. Tauber
1970		
Gerald B. Cohen	Carnegie Mellon U.	F. Cecil Brenner
Nordulf W.G. Debye	Cornell U.	James R. Devoe and Melvin Linzer

Douglas L. Franzen	U. of Minnesota	Harold S. Boyne
John W. Gramlich	U. of Hawaii	I. Lynus Barnes
William M. Haynes	U. of Virginia	Dwain E. Diller
Elizabeth J. Jacob	U. of Michigan	David R. Lide, Jr.
Andrew Kaldor	Cornell U.	Arthur G. Maki, Jr.
George E. Kelly	Northwestern U.	Max Klein and Johanna M. H. Levelt Sengers
Donald R. Lehman	George Washington U.	Michael Danos
Frank J. Lovas	U. of California/Berkeley	David R. Lide, Jr.
Michael A. Marchetti	Georgetown U.	Frederick H. Mies
Bruce W. Morrissey	Rensselaer Polytechnic Institute	Robert R. Stromberg
Donald W. Regula	Wayne State U.	Gershon Kulin
Michael W. Schuyler	Indiana U.	Richard A. Keller
Mark E. Sheingorn	U. of Wisconsin	Morris Newman
Carroll A. Shelton	U. of Pittsburgh	Stanley Block
Siegfried Treu	U. of Pittsburgh	Charles T. Meadow and Thomas N. Pyke

1971

John H. Albers	Massachusetts Institute of Technology	Raymond D. Mountain
George H. Atkinson	Indiana U.	Richard A. Keller
Frank P. Billingsley	U. of Virginia	Morris Krauss
Marvin Bishop	Columbia U.	Edmund A. DiMarzio
Harry S. Camarda	Columbia U.	Harry H. Landon
James F. Ely	Indiana U.	Dwain E. Diller
Clark A. Hamilton	U. of Rochester	Robert A. Kamper and Kenneth M. Evenson
Camden R. Hubbard	Iowa State U.	Floyd A. Mauer
Charles E. Hughes	Pennsylvania State U.	Charles T. Meadow
Joel F. Liebman	Princeton U.	Thomas D. Coyle
James J. Murphy	U. of Illinois	William R. Dodge
Robert C. Reno	Brandeis U.	Lawrence H. Bennett
Raymond C. Sansing	Southern Methodist U.	Joan R. Rosenblatt
Emil Simiu	Princeton U.	Edward O. Pfrang
Michael B. Simmonds	U. of California/Irvine	James E. Zimmerman
Arthur D. Yaghjian	Brown U.	David M. Kerns
Gerald A. Zerdy	U. of Maryland	Martin Greenspan

1972

Robert E. Berger	Johns Hopkins U.	Melvin R. Meyerson
William J. Boettinger	Johns Hopkins U.	Robert L. Parker
Lawrence S. Cardman	Yale U.	Samuel Penner
Richard S. Davis	U. of Maryland	Barry N. Taylor and Vincent E. Bower
John R. Eyler	Stanford U.	L. Wayne Sieck
James C. Holste	Iowa State U.	Ray Radebaugh
Charles R. Johnson	California Institute of Technolgy	Morris Newman
James R. Lyerla, Jr.	U. of Utah	Dennis A. Torchia
George W. Mulholland	Cornell U.	Raymond W. Mountain
Edwin R. Naimon	U. of Illinois	Richard P. Reed
Charles A. Nelson	U. of Maryland	Sydney Meshkov
Dale E. Newbury	U. of Oxford, England	Harvey Yakowitz
James D. Olson	Michigan State U.	Howard J.M. Hanley
Michael G. Reimer	U. of Pennsylvania	Philip D. Lafleur

Michael S. Sorem	Stanford U.	Donald A. Jennings
Carl F. Stubenrauch	U. of Michigan	Ramon C. Baird
Daniel M. Sweger	American U.	John C. Travis and James J. Rhyne
E. Clayton Teague	North Texas State U.	Russell D. Young
Tommy C. Tong	U. of Michigan	David M. Kerns
James C. Tsang	Massachusetts Institute of Technology	Hans P. R. Frederikse

1973

Edwin D. Cehelnik	Pennsylvania State U.	Oscar Menis
Frank O. Clark	U. of Virginia	Donald R. Johnson
Harry J. Dewey	U. of Utah	Richard D. Deslattes
Robert E. Drullinger	Columbia U.	Earl W. Smith
John W. Ekin	Cornell U.	Robert L. Powell
Barry L. Farmer	Case Western Reserve U.	Ronald K. Eby
John P. Ferraris	John Hopkins U.	Martin G. Broadhurst
Edwin R. Fuller, Jr.	U. of Illinois	Sheldon M. Wiederhorn
Robert J. Hocken	State U. of New York/Stony Brook	Johanna M. H. Levelt Sengers
David E. Laughlin	Massachusetts Institute of Technology	Robert L. Parker
Larry L. Lucas	U. of California/Davis	Wilfrid B. Mann
Jon J. McCarthy	Iowa State U.	Evans V. Hayward
Evelyn M. Rockar	U. of California/Riverside	Herbert S. Bennett and Richard A. Forman
Douglas R. Shier	U. of London, England	Alan J. Goldman
Allen R. Siedle	Indiana U.	Thomas D. Coyle
James J. Snyder	State U. of New York/Stony Brook	Peter L. Bender
Marjorie L. Stein	Princeton U.	Burton H. Colvin and Alan J. Goldman
Roger L. Stockbauer	U. of Chicago	Henry M. Rosenstock
Nicholas Vagelatos	U. of Michigan	John J. Rush
Bernard A. Weinstein	Brown U.	Richard A. Forman
William F. Weston	U. of Illinois	Richard P. Reed
John T. Yue	Stanford U.	J. William Gadzuk

1974

Robert S. Butler	Pennsylvania State U.	Paul F. Roth
Ilan S. Chabay	U. of Chicago	Wayne A. Cassatt, Jr.
Robert B. Feinberg	U. of Wisconsin	Morris Newman
Ronald F. Fleming	U. of Michigan	Ivan G. Schroder
Robert B. Green	Ohio U.	John C. Travis
Joseph W. Haus, Jr.	Catholic U. of America	Harold J. Raveche
Jan F. Herbst	Cornell U.	J. William Gadzuk
Warren W. Johnson	Rutgers U.	Michael C. Jones
Nell D. Lerner	Brown U.	Martin Greenspan
Rodney A. McKee	U. of Texas	John R. Manning
Eric B. Miller	Duke U.	....
Harry Morgan	Howard U.	....
John A. Mucha	U. of Pittsburgh	Kenneth A. Evenson
George E. Parris	Georgia Institute of Technology	Frederick E. Brinckman
Richard J. Pearson, Jr.	Harvard U.	Frank J. Lovas
Bruce J. Pletka	Case Western Reserve U.	Sheldon M. Wiederhorn
David T. Read	U. of Illinois	Richard P. Reed
William L. Rowan	U. of Texas	Wolfgang L. Wiese

Peter J. Slater	U. of Iowa	Alan J. Goldman
Samuel R. Stein	Stanford U.	Helmut Hellwig
John B. West	U. of California/Santa Barbara	Jerry P. Eaton

1975

Dennis M. Breiter	U. of Maryland	Kurt F. J. Heinrich
Jason Gait	Weslayan U.	Hans J. Oser
Karla L. Hoffman	George Washington U.	Alan J. Goldman
Duane R. Kirklin	U. of Maryland	Stanley Abramowitz
William F. Koch	Iowa State U.	Robert J. Cutkosky
David S. Malkus	Boston U.	Jeffrey T. Fong
Ronald G. Manning	U. of California/Davis	John T. Herron
Herbert A. Robinson	U. of California/Santa Barbara	Morris Newman
Paul M. Skarstad	Cornell U.	Robert S. Roth
Richard D. Suenram	U. of Kansas	Donald R. Johnson

1976

Bruce J. Ackerson	U. of Colorado	Gerald C. Straty
Dennis R. Dietz	Washington U.	Melvin Linzer
Edward T. Dressler	American U.	James S. O'Connell
Pashang Esfandiari	Catholic U. of America	Johanna M. H. Levelt Sengers
David D. Evans	Harvard U.	Clayton Huggett
Robert M. Garvey	Duke U.	Helmut Hellwig
David W. Goodman	U. of Texas	John T. Yates, Jr.
Robert R. Greenberg	U. of Maryland	Philip D. Lafleur
Dane L. Harwood	U. of California/Los Angeles	Edward B. Magrab
Robert H. Havemann	U. of Colorado	Robert J. Phelan, Jr.
Frank P. Higgins	U. of Denver	Melvin Linzer
Richard L. Kautz	Massachusetts Institute of Technology	Donald G. McDonald
Marvin D. Kemple	U. of Illinois	Billy W. Mangum
Eric C. Kintner	U. of Edinburgh, Scotland	----
Donald C. Knauss	Northern Illinois U.	----
John R. Long	Ohio State U.	Thomas D. Coyle
Richard I. Martinez	U. of California/Los Angeles	John T. Herron
Gregory B. McKenna	U. of Utah	Elliott Kearsley
Ronald G. Munro	U. of Oregon	Herbert S. Bennett
Robert S. Polvani	U. of Connecticut	Arthur W. Ruff
John F. Rabolt	Southern Illinois U.	Bruno Fanconi
James C. Rainwater	U. of Colorado	Howard J.M. Hanley
Garry L. Ritter	U. of North Carolina	Lloyd A. Currie
David M. Shold	U. of Chicago	Pierre Ausloos
John A. Small	U. of Maryland	Wayne A. Cassatt, Jr.
Terry R. Todd	Pennsylvania State U.	William B. Olson
William N. Unerti	U. of Wisconsin	Robert J. Celotta and Daniel T. Pierce

1977

James E. Bond	Yale U	Charles D. Bowman
Brian M. Ditchek	Northwestern U.	Arthur W. Ruff
Flonnie Dowell	Georgetown U.	Edmund A. DiMarzio
Michael C. Drake	Pennsylvania State U.	John W. Hastie
Brett I. Dunlap	Johns Hopkins U.	J. William Gadzuk
William L. Earl	U. of California/Berkeley	David L. VanderHart
Richard J. Fields	U. of Cambridge, England	Jeffrey T. Fong
Gordon E. Fish	U. of Illinois	Lydon J. Swartzendruber

Steven W. Haan	U. of Maryland	Raymond D. Mountain
Robert H. Kagann	U. of Colorado	Merrill M. Hessel
Steven B. Kaplan	U. of Pennsylvania	James E. Zimmerman
George M. Keiser	Duke U.	James E. Faller
Edward F. Kelley	Montana State U.	Robert E. Hebner
James F. Lawrence	U. of Washington	Alan J. Goldman
Joanne L. Murray	U. of Maryland	Donald H. Tsai
David R. Myers	U. of Illinois	W. Murray Bullis
Stephen J. Norton	Stanford U.	George Birnbaum
Timothy A. Reinhold	Virginia Polytechnic Institute	Robert A. Crist, Jr.
Peter Roitman	Princeton U.	W. Murray Bullis
Richard J. Saykally	U. of Wisconsin	Kenneth M. Evenson
Stephan J. Weeks	U. of Florida	John C. Travis

1978

Martin E. Batts	U. of Michigan	Emil Simiu
Steven L. Baughcum	Harvard U.	Stephen R. Leone
James C. Bergquist	U. of Colorado	Richard L. Barger
Stephen E. Bialkowski	U. of Utah	John C. Stephenson
Robert J. Cava	Massachusetts Institute of Technology	Robert S. Roth
Richard R. Cavanagh	Harvard U.	John T. Yates, Jr.
Lawrence M. Doane	U. of Connecticut	Richard A. Durst
Theodore D. Doiron	Duke U.	Sandra C. Greer
Keith R. Eberhardt	Johns Hopkins U.	Joan R. Rosenblatt
James T. Hall	U. of California/Santa Barbara	Robert J. Soulen, Jr.
John C. Hamilton	Cornell U.	Daniel T. Pierce
Gary G. Hembree	Arizona State U.	Dennis A. Swyt
Jeffrey A. Hinkley	U. of Wisconsin	Donald M. Novotny
John B. Ings	Rutgers U.	Geoffrey Frohnsdorff
David J. Lohse	U. of Illinois	Isaac C. Sanchez
Jay F. Marchiando	Iowa State U.	Dennis A. Swyt
Duane P. Matthees	U. of Maryland	Robert Schaffer
John E. Orban	Ohio State U.	Joan R. Rosenblatt
Anastasi Papathanasis	U. of California/Davis	Harold E. Marshall
John C. Schaefer	U. of Chicago	....
Alexander Scheeline	U. of Wisconsin	James R. Devoe
Charles F. Scribner	U. of Michigan	Edgar V. Leyendecker
Richard D. Starr	U. of Illinois	Evans V. Hayward
Stephen M. Younger	U. of Maryland	Andrew W. Weiss

1979

John G. Abbott	Duke U.	Melvin Linzer
James R. Bethin	U. of Illinois	Alan D. Franklin
Robert E. Botto	Michigan State U.	Bruce Coxon
Michael W. Cromar	U. of Oregon	Donald B. Sullivan
Michael J. Dipirro	State U. of New York/Buffalo	Craig T. Van Degrift
Charles Fenimore	U. of California/Berkeley	Ronald G. Rehm
Vincent J. Fratello	Harvard U.	Charles Tilford
Ronald B. Goldfarb	Colorado State U.	Frederick R. Fickett
John E. Goldsmith	Stanford U.	Stephen J. Smith
Ronald L. Greene	U. of Colorado	Larry J. Roszman
Gregory L. Griffin	Princeton U.	John T. Yates, Jr.
Arthur J. Grimley	Cornell U.	John C. Stephenson
Stephen J. Grotzinger	Rensselaer Polytechnic U.	Christoph J. Witzgall
Virginia K. Hardman	U. of Missouri	James J. Rhyne

Wayne M. Itano	Harvard U.	David J. Wineland
Harold D. Ladouceur	Purdue U.	Jon T. Hougen
Frank Magnotta	U. of California/Berkeley	Stephen R. Leone
Terry A. Michalske	Alfred U.	Sheldon M. Wiederhorn
Gregory J. Olson	Montana State U.	Warren P. Iverson
Ronald W. Rendell	U. of California/Santa Barbara	David R. Penn
Thomas M. Shay	Colorado State U.	James J. Snyder
David A. Vanbaak	Harvard U.	John L. Hall
Deborah Van Vechten	U. of Maryland	Robert J. Soulen, Jr.
Richard F. Wormsbecher	U. of California/Santa Barbara	Frank J. Lovas

1980

Garnett W. Bryant	Indiana U.	J. William Gadzuk
Eldon D. Case	Iowa State U.	Edwin R. Fuller, Jr.
Robert M. Davidson	U. of California/San Francisco	Bruce Coxon
Robert W. Gerlach	U. of Washington	Lloyd A. Currie
David A. Goodman	U. of California/Berkeley	John R. Cuthill
Richard E. Hanig	Purdue U.	Robert B. Schwartz
George J. Havrilla	West Virginia U.	John C. Travis
Wendell T. Hill III	Stanford U.	Thomas B. Lucatorto
William C. Johnson	Michigan Technological U.	John W. Cahn
Douglas W. Jones	U. of Arizona	Wolfgang L. Wiese
Ronald D. Kriz	Virginia Polytech Institute	Maurice B. Kasen
Kathryn A. Lee	City College of New York	Donald R. Durst
Gabriel G. Lombardi	Harvard U.	James R. Roberts
Michael Martinka	Pennsylvania State U.	Alan J. Melmed
John H. Miller	U. of Virginia	Kermit C. Smyth
Boyce M. Morrison, Jr.	Pennsylvania State U.	John T. Herron
Paul M. Nachman	U. of Chicago	John L. Hall
Clifford R. Pollock	Rice U.	Kenneth M. Evenson
John S. Provan	Cornell U.	Christoph J. Witzgall
Dorothy A. Reed	Princeton U.	Emil Simiu
Wade T. Rogers	U. of Colorado	Robert J. Celotta
Stephen Semancik	Brown U.	Theodore E. Madey
Robert Stahlbush	Cornell U.	Richard A. Forman
Carl S. Weiss	Washington State U.	Frederick E. Brinckman

1981

Eric J. Amis	U. of Wisconsin	Charles C. Han
Tim D. Andreadis	U. of Maryland	Joseph Fine
Michael R. Berman	U. of California/Berkeley	John C. Stephenson
Joseph A. Blazy	U. of Chicago	John C. Stephenson
Thomas J. Bruno	Georgetown U.	Howard J.M. Hanley
Charles W. Clark	U. of Chicago	Andrew W. Weiss
Dale L. Doering	Washington State U.	Theodore E. Madey
David A. Dolson	Indiana U.	Stephen R. Leone
Robert G. Downing	U. of Missouri	Dale E. Newbury
Michael A. Duncan	Rice U.	Stephen R. Leone
Jeffrey R. Fox	Cornell U.	Robert D. McCarty
Michael H. Kelley	U. of Texas	Robert J. Celotta
Walter R. Lampert	U. of Utah	Alfons Weber
Timothy P. Lodge	U. of Wisconsin	Charles C. Han
Joseph V. Minervini	Massachusetts Institute of Technology	Donald B. Sullivan

Donald R. Myers	Drexel U.	James S. Albus
David J. Nesbitt	U. of Colorado	John L. Hall
Steven R. Nutt	U. of Virginia	Arthur W. Ruff
John V. Prodan	Colorado State U.	William D. Phillips
Steven R. Ray	Princeton U.	Hratch G. Semerjian
Mark A. Zumberge	U. of Colorado	Judah Levine

1982

John J. Bollinger	Harvard U.	David J. Wineland
Daniel G. Friend	U. of Colorado	James C. Rainwater
Vicky L. Himes	Catholic U. of America	Antonio Santoro
Anna E. McHale	Massachusetts Institute of Technology	Robert S. Roth
Andrew K. Persily	Princeton U.	Richard A. Grot
Kenneth W. Pratt	Iowa State U.	William F. Koch
Gregory A. Reynolds	Virginia Polytechnic Institute	Baldwin Robertson
Stephen B. Sears	U. of North Carolina	Frederick H. Mies
Stephen H. Southworth	U. of California/Berkeley	Albert C. Parr
Brian R. Stallard	Cornell U.	Stanley L. Shapiro

1983

Robert F. Berg	U. of Florida	Michael R. Moldover
John E. Blendell	Massachusetts Institute of Technology	Taki Negas
Benjamin P. Burton	State U. of New York/Stony Brook	Taki Negas
Michael P. Casassa	California Institute of Technology	Richard C. Cavanagh
Christopher L. Cromer	U. of Southern California	Thomas B. Lucatorto
Robert A. Dragoset	U. of Virginia	E. Clayton Teague
Charles S. Feigerle	U. of Colorado	Robert J. Celotta
William E. Fogle	U. of California/Berkeley	Robert J. Soulen, Jr.
Joe P. Foley	U. of Florida	Willie E. May
Katherine G. Frase	U. of Pennsylvania	Taki Negas
John J. Horvath	U. of Florida	Hratch G. Semerjian
John K. Hoskins	U. of California/Irvine	James E. Faller
Eugene A. Imhoff	Cornell U.	Michael I. Bell
George J. Jelatis	Pennsylvania State U.	Michael R. Moldover
George R. Jones	U. of Virginia	Edwin R. Williams
Richard L. Kurtz	Yale U.	Roger L. Stockbauer
Pui K. Lam	U. of California/Berkeley	Steven M. Girvin
Martin K. Ligare	Columbia U.	Daniel E. Kelleher
Thomas P. Lockhart	California Institute of Technology	Frederick E. Brinckman
William F. Manders	U. of Maryland	David L. VanderHart
David A. Mantell	Yale U.	Richard R. Cavanagh
Ronald H. Ono	State U. of New York/Stony Brook	Richard E. Harris
Neal D. Shinn	Massachusetts Institute of Technology	Theodore E. Madey
Terrence J. Udovic	U. of Wisconsin	Theodore E. Madey
Michael J. Wax	U. of California/Berkeley	Theodore E. Madey
Indrek S. Wichman	Princeton U.	Takashi Kashiwagi
Perry F. Wilson	U. of Colorado	Mark T. Ma
Lawrence A. Woltz	U. of Florida	Larry J. Roszman

1984

Regina E. Bonanno	U. of Maryland	Thomas B. Lucatorto
Charles E. Bouldin	U. of Washington	Richard A. Forman
Robert M. Briber	U. of Massachusetts	Fred A. Khoury
David F. Cox	U. of Florida	Stephen Semancik

Brian E. Eaton	U. of Colorado	James F. Ely
Carol A. Handwerker	Massachusetts Institute of Technology	John R. Manning
Jonathan E. Hardis	U. of Chicago	Albert C. Parr
Edwin J. Heilweil	U. of Pennsylvania	John C. Stephenson
Paul G. Jasien	U. of Illinois	Walter J. Stevens
John W. Keller	U. of Maryland	Robert P. Madden
Kenneth R. Leopold	Harvard U.	Kenneth M. Evenson
Joe W. Magee	Rice U.	Thomas M. Flynn
Howard T. Mayfield	U. of Alabama	Stephen N. Chesler
Alan L. Migdall	Massachusetts Institute of Technology	William D. Phillips
Bruce R. Miller	U. of Texas	Andre Deprit
John M. Moreland	U. of California/Santa Barbara	John W. Ekin
Barry F. Muhlfelder	U. of Rochester	Donald G. McDonald
Glen C. Nielson	U. of Chicago	Harold J. Raveche
Richard E. Preston	Princeton U.	Hratch G. Semerjian
Phillip D. Szuromi	California Institute of Technology	Theodore E. Madey
Philip H. Taylor	Pennsylvania State U.	Kermit C. Smyth
George A. Thompson	New York City Technical College	Alfons Weber
R.M. Verkouteren	Purdue U.	Lloyd A. Currie
Karna J. Wahlstrand	Harvard U.	Martin G. Broadhurst
Anne M. Woodward	Yale U.	John C. Stephenson
Timothy J. Wozniak	Indiana U.	Harry S. Hertz

1985

Penrose C. Albright	U. of Maryland	Johanna M. H. Levelt Sengers
Jacques G. Amar	Temple U.	Harold J. Raveche
Michael G. Ambrose	Cleveland State U.	Bruce Coxon
Donald R. Burgess, Jr.	Northwestern U.	Richard C. Cavanagh
Thomas W. Coyle	Massachusetts Institute of Technology	Sheldon M. Wiederhorn
Paula M. Davidson	State U. of New York/Stony Brook	John W. Hastie
Jon W. Erickson	Brown U.	Stephen Semancik
Ross W. Erwin	U. of Maryland	James J. Rhyne
Gerald T. Fraser	Harvard U.	Alan S. Pine
Sarah L. Gilbert	U. of Michigan	David J. Wineland
Stephen A. Hackney	U. of Virginia	John W. Cahn
Robert W. Harrison	Yale U.	Alexander Wlodawer
Marcia L. Huber	Colorado School of Mines	James F. Ely
Randall G. Hulet	Massachusetts Institute of Technology	David J. Wineland
Bettye C. Johnson	Harvard U.	Thomas B. Lucatorto
Russell D. Johnson	U. of Minnesota	Jeffrey W. Hudgens
Robert K. Jones	Indiana U.	Robert J. Celotta
Leonard E. Klebanoff	U. of California/Berkeley	Daniel T. Pierce
Lindsay B. Lloyd	U. of Utah	Alan Fried
Jeffrey A. Marqusee	Massachusetts Institute of Technology	Isaac C. Sanchez
David L. Moffat	U. of Wisconsin	Joanne L. Murray
David H. Roach	Case Western Reserve U.	Brian R. Lawn
Craig A. Rottman	U. of Illinois	John W. Cahn
Joseph V. Rutkowski	Dartmouth College	Richard C. Gann
Damian Shea	U. of Maryland	William A. MacCrehan
Daniel A. Steigerwald	Carnegie Mellon U.	William F. Egelhoff, Jr.
Peter L. Swanson	U. of Colorado	Stephen W. Freiman
Richard J. Walker	State U. of New York/Stony Brook	Larry J. Moore

1986

Richard T. Brundage	U. of Wisconsin	Michael I. Bell
Diane S. Bushee	Northeastern U.	Paul J. Paulsen
John C. Clark	U. of Minnesota	Charles C. Han
James P. Cline	Alfred U.	Camden R. Hubbard
Michael J. Deweert	U. of Notre Dame	Steven M. Girvin
Teresa B. Fryberger	Northwestern U.	Stephen Semancik
Phillip L. Gould	Massachusetts Institute of Technology	William D. Phillips
Allen L. Johnson	U. of California/Berkeley	Theodore E. Madey
John H. Shibata	U. of Washington	Francis W. Wang
David M. Sonnenfroth	U. of Rochester	Stephen R. Leone

1987

Steven A. Buntin	U. of Minnesota	Richard R. Cavanagh
Laurence D. Coyne	U. of Massachusetts	Wen-Li Wu
Jack F. Douglas	U. of Chicago	Charles C. Han
Phillip N. First	U. of Illinois	Robert J. Celotta
Dale W. Fitting	U. of Tennessee	Ronald D. Kriz
Bernard R. Foy	Massachusetts Institute of Technology	John C. Stephenson
David R. Garmer	Pennsylvania State U.	Walter J. Stevens
Mark W. Hart	Rice U.	Daniel T. Pierce
Stephen A. Joyce	Massachusetts Institute of Technology	Theodore E. Madey
Susan T. Krueger	U. of Maryland	Gregory J. Olson
Alan I. Nakatani	U. of Connecticut	Charles C. Han
David D. Nelson	Harvard U.	David J. Nesbitt
Vicki G. Niesen	Colorado School of Mines	Lloyd A. Weber
Margo D. Palmieri	Iowa State U.	William F. Koch
Stephen M. Penn	U. of Wisconsin	Stephen R. Leone
Joseph E. Sauvageau	State U. of New York/Stony Brook	Donald G. McDonald
Thomas W. Stafford, Jr.	U. of Arizona	Lloyd A. Currie
Richard N. Watts	U. of Michigan	William D. Phillips
Christoph I. Westbrook	U. of Michigan	William D. Phillips

1988

Muhammad Arif	U. of Missouri	Geoffrey L. Greene
John D. Beckerle	Massachusetts Institute of Technology	Richard R. Cavanagh
Lucien N. Brush	Carnegie Mellon U.	Geoffrey B. McFadden
David V. Dearden	California Institute of Technology	Jeffrey W. Hudgens
Richard L. Dubs	California Institute of Technology	Paul S. Julienne
Roger A. Edberg	Australian National U.	Howard J.M. Hanley
Stephen J. Fischer	Washington State U.	Bernard J. McCaffrey
John D. Gillaspy	Harvard U.	Daniel E. Kelleher
Allan H. Harvey	U. of California/Berkeley	Johanna M. H. Levelt Sengers
Daniel J. Heinzen	Massachusetts Institute of Technology	James C. Bergquist
Martin E. Huber	Stanford U.	Michael W. Cromar
Catheryn L. Jackson	U. of Connecticut	Gregory B. McKenna
Gregg M. Jankowski	Michigan Technical U.	Richard J. Fields
Peter J. Martin	Massachusetts Institute of Technology	John L. Hall
Christopher W. Meyer	U. of California/Santa Barbara	Michael R. Moldover
Paul J. Miller	Yale U.	Stephen R. Leone
Bruce T. Murray	U. of Arizona	Geoffrey B. McFadden
Lee J. Richter	Cornell U.	Richard R. Cavanagh
Jamal A. Sandarusi	Colorado School of Mines	William M. Haynes

Ray E. Snyder	Stanford U.	Hratch G. Semerjian
Mark A. Sobolewski	Stanford U.	Stephen Semancik
Carol E. Tanner	U. of California/Berkeley	William D. Phillips
Thomas J. Walsh	U. of Oregon	Richard E. Harris
Lloyd J. Whitman	Cornell U.	Theodore E. Madey
Joseph C. Woicik	Stanford U.	Michael I. Bell

1989

Stephen A. Angel	U. of Colorado	John C. Stephenson
Julie A. Borchers	U. of Illinois	James J. Rhyne
W.C. Carter	U. of California/Berkeley	Edwin R. Fuller, Jr.
Edith S. Grabbe	U. of North Carolina	Dennis J. Reeder
Dennis W. Hair	U. of Southern California	Charles C. Han
Steven R. Lorentz	U. of Oklahoma	Michael H. Kelley
Christopher M. Lovejoy	U. of Colorado	Stephen R. Leone
James P. Moran	U. of Virginia	Dale A. Meyn
Thomas S. Norton	Princeton U.	Kermit C. Smyth
Mark G. Raizen	U. of Texas	David J. Wineland
Allison C Sandlin	U. of Alabama	Robert J. Schaefer
Weston L. Tew, Jr.	U. of Colorado	Edwin R. Williams
Dean A. Waldow	U. of Wisconsin	Charles C. Han
James R. Zurio	Carnegie Mellon U.	Cary Presser

1990

Michael R. Frey	U. of North Carolina	James J. Filiben
David T. Gallagher	U. of Texas	Gary L. Gilliland
Alexis Grabbe	U. of North Carolina	Brian R. Lawn
Kristian P. Helmerson	Massachusetts Institute of Technology	William D. Phillips
Joanne R. Hetzler	Massachusetts Institute of Technology	David S. King
Erik K. Hobbie	U. of Minnesota	Charles C. Han
David C. Humm	U. of Illinois	Charles W. Clark
John A. Kramar	California Institute of Technology	E. Clayton Teague
Curtis G. Lindsay	Virginia Polytechnic Institute	Robert S. Roth
Robert D. McMichael	Ohio State U.	Lawrence H. Bennett
Nhan V. Nguyen	Pennsylvania State U.	David G. Seiler
Eric C. Palm	Texas A&M U.	Craig T. Van Degrift
Cecilia D. Richards	U. of California/Irvine	William M. Pitts
Stephen E. Russek	Cornell U.	John W. Ekin
Deborah G. Sauder	Johns Hopkins U.	John C. Stephenson
William M. Snow	Harvard U.	Geoffrey L. Greene
Kevin A. Sparks	Massachusetts Institute of Technology	James F. Ely
Paul G. Strupp	Northwestern U.	Stephen R. Leone
Lorraine E. Twerdok	Johns Hopkins U.	Michael G. Simic
Barry J. Wythoff	U. of New Hampshire	Lloyd A. Currie
Gregory A. Zimmerli	Pennsylvania State U.	Richard E. Harris

1991

David S. Alavi	U. of Pittsburgh	Michael P. Casassa
Richard J. Braun	Northwestern U.	Geoffrey B. McFadden
Michael J. Chester	U. of Pennsylvania	Terrence J. Jach
Neil D. Clarke	Massachusetts Institute of Technology	Gary L. Gilliland
Mark D. Dadmun	U. of Massachusetts	Charles C. Han
Thomas P. Dougherty	Massachusetts Institute of Technology	Edwin J. Heilweil
Edward A. Early	U. of California/San Diego	Alan F. Clark

Ofodike A. Ezekoye	U. of California/Berkeley	Howard R. Baum
Timothy J. Foecke	U. of Minnesota	Robb M. Thomson
Jonathan M. Gilligan	Yale U.	David J. Wineland
Lori S. Goldner	U. of California/Santa Barbara	William D. Phillips
Joel E. Harrington	U. of Wisconsin	Kermit C. Smyth
Cynthia D. Holcomb	Cornell U.	William M. Haynes
Karl K. Irikura	California Institute of Technology	Jeffrey W. Hudgens
Mark T. Kief	Pennsylvania State U.	William F. Egelhoff, Jr.
William E. Luecke	Cornell U.	Sheldon M. Wiederhorn
Kevin B. McGrattan	New York U.	Ronald G. Rehm
Thomas H. McWaid	U. of California/Santa Barbara	Theodore V. Vorburger
Thomas R. O'Brian	U. of Wisconsin	Thomas B. Lucatorto
William J. Orts	U. of Toronto, Canada	Wen-Li Wu
Brooks H. Pate	Princeton U.	Gerald T. Fraser
Gregory E. Poirier	U. of Texas	Stephen Semancik
Martin E. Poitzsch	Harvard U.	John J. Bollinger
Jack L. Robertson	U. of Houston	John J. Rush
Peter A. Rosenthal	Stanford U.	Ronald H. Ono
Russell V. Smilgys	U. of Colorado	Richard L. Kurtz
Michael R. Winchester	Clemson U.	Gregory C. Turk

1992

Carmela C. Amato	Rensselaer Polytechnic Institute	Michael R. Zachariah
Anne M. Andrews	U. of Michigan	Gerald T. Fraser
John R. Berger	U. of Maryland	David T. Read
Jeffrey L. Brum	Tulane U.	Jeffrey W. Hudgens
David M. Bunk	Texas A&M U.	Michael J. Welch
Mun Y. Choi	Princeton U.	Anthony Hamins
Mark W. Coffee	New York U.	Ronald B. Goldfarb
Michael Collison	U. of Michigan	Michael J. Tarlov
Andrew D. Gavrin	Johns Hopkins U.	Michael H. Kelley
James A. Given	Boston U.	Johanna M. H. Levelt Sengers
Steven R. Jefferts	U. of Colorado	David J. Wineland
Alan T. Johnson	Harvard U.	John M. Martinis
Daniel Josell	Harvard U.	Carol A. Handwerker
John J. Kasianowicz	State U. of New York/Stony Brook	Baldwin Robertson
Christopher R. Monroe	U. of Colorado	James C. Bergquist
Janet F. Morrison	American U.	William A. MacCrehan
Warren L. Nachlis	U. of Massachusetts	Charles C. Han
Steven H. Page	Brigham Young U.	Stephen A. Wise
David F. Plusquellic	U. of Pittsburgh	David J. Nesbitt
Laura P. Ratliff	U. of Virginia	Paul D. Lett
Joseph P. Rice	U. of Illinois	David A. Rudman
Jonathan M. Richardson	Harvard U.	Geoffrey L. Greene
Barbara A. Sanborn	State U. of New York/Stony Brook	Herbert S. Bennett
Thaddeus Tarpey	Indiana U.	Dominic F. Vecchia
John H. Van Zanten	U. of California/Los Angeles	Wen-Li Wu
Roger D. Van Zee	U. of California/Berkeley	John C. Stephenson

1993

Levent Acar	Ohio State U.	James S. Albus
David T. Anderson	Dartmouth College	David J. Nesbitt
Philip J. Austin	U. of Michigan	Takashi Kashiwagi
Amy S. Barton	Princeton U.	David J. Wineland

Dennis E. Brown	Stanford U.	David M. Gilliam
Gregg P. Bryant	Purdue U.	David S. King
Jeffrey W. Bullard	U. of California/Berkeley	Edward J. Garboczi
Brent D. Butler	Northwestern U.	Howard J.M. Hanley
Sean M. Casey	U. of Minnesota	Stephen R. Leone
Kevin W. Cassel	Lehigh U.	Ronald G. Rehm
Lance D. Cooley	U. of Wisconsin	Robert N. Goldberg
Donald C. Degroot	Northwestern U.	David A. Rudman
Ivan H. Deutsch	U. of California/Berkeley	William D. Phillips
Joseph A. Dura	U. of Illinois	Charles F. Majkrzak
Sharon C. Glotzer	Boston U.	Edmund A. DiMarzio
William T. Grubbs	Duke U.	Edwin J. Heilweil
Leonard A. Hayden	Oregon State U.	Roger B. Marks
Lowell P. Howard	U. of Warwick, England	E. Clayton Teague
Arthur W. Johnson	Yale U.	William M. Pitts
Robert R. Keller	U. of Minnesota	David T. Read
William D. Lee	U. of Texas	Robert E. Drullinger
Mary L. Lewis	U. of Wyoming	Anne L. Plant
James E. Maslar	U. of Illinois	Michael R. Zachariah
Brian K. McMillin	Stanford U.	Michael R. Zachariah
Eric S. Meyer	Harvard U.	Wolfgang L. Wiese
Dmitry Reznik	U. of Illinois	Daniel A. Neumann
Curt A. Richter	Yale U.	David G. Seiler
Andrew R. Roosen	Rutgers U.	John W. Cahn
Peter N. Saeta	Harvard U.	Alan C. Gallagher
Christopher R. Shaddix	Princeton U.	Kermit C. Smyth
Ping-Shine Shaw	Columbia U.	Richard D. Deslattes
Mark G. Vangel	Harvard U.	Keith R. Eberhardt
Elizabeth Widom	U. of California/Santa Cruz	Robert D. Vocke, Jr.
Dennis C. Winkler	U. of Maryland	Dale E. Newbury
Brian D. Wladkowski	Stanford U.	Walter J. Stevens

Sources:

1. *National Research Council Directory of Resident Research Associates, 1959-1995, (Washington, DC: National Academy Press, 1996),* 740 pp. [Author's note: Some of the information in this source was incomplete or inaccurate.]
2. *NBS Standard* (Official employee bulletin).
3. *NBS Technical News Bulletin* and *NBS Dimensions.*
4. Personal inquiry by Diane Cunningham, NIST Reference Librarian.

APPENDIX G

SCIENTIFIC AWARDS GIVEN BY THE DEPARTMENT OF COMMERCE AND NBS/NIST TO STAFF MEMBERS, 1968-1993

The Arthur S. Flemming Award, established in 1948, honored unusually meritorious work in either science or administration by federal employees under the age of 40. The award was sponsored by the Washington Junior Chamber of Commerce.

The Gold Medal, established in 1949, was the highest honor conferred upon an employee by the Department of Commerce. It was bestowed for distinguished achievements of major significance to the Department or to the Nation.

The Federal Woman's Award, established in 1961, honored outstanding contributions by female Federal employees to major government programs, and recognized unusual examples of personal leadership, judgment, integrity, and dedication.

The Samuel Wesley Stratton Award was created by NBS in 1962 to recognize unusually significant research contributions to science or engineering that merited the acclaim of the scientific world and supported NBS/NIST objectives.

The Edward Bennett Rosa Award, established by NBS in 1964, recognized outstanding achievements in the development of meaningful and significant standards of practice in the measurement field.

The Edward Uhler Condon Award was given by NBS, beginning in 1974, to recognize distinguished achievements in written exposition in science or technology.

The Applied Research Award, established by NBS in 1975, recognized superior achievement in the practical application of the results of scientific or engineering research.

The Measurement Services Award was established by NBS in 1980 to recognize outstanding achievement in calibration and related measurement areas by NBS employees.

The Allen V. Astin Measurement Science Award, first given by NBS in 1984, recognized outstanding achievement in the advancement of measurement science or in the delivery of measurement services.

The William P. Slichter Award, established by NIST in 1992, recognized outstanding achievements by NIST staff in building or strengthening ties between NIST and industry. The award was named as a memorial to William P. Slichter, Executive Director, Materials Science and Engineering Division, AT&T Bell Laboratories, who served on the first NIST Visiting Committee for Advanced Technology.

1968

Gold Medal Awards—
Louis Costrell
Henry J. Kostkowski
Lawrence M. Kushner
David R. Lide, Jr.
Kurt E. Shuler
Group:
Carl O. Muehlhause, Harry H. Landon, Jr., Robert S. Carter.

Stratton Award—David R. Lide, Jr.
Rosa Award—W. Wayne Meinke

National Civil Service League, Career Service Award—Lewis M. Branscomb

1969
Flemming Award—Richard D. Deslattes

Gold Medal Awards—
John A. Bennett
Daniel V. DeSimone
Vernon H. Dibleler
John L. Hall
Samuel Penner
Bourdon F. Scribner

1970
Gold Medal Awards—
Alan D. Franklin
Joseph Hilsenrath
Donald A. Jennings
Malcolm W. Jensen
Walter Koidan
Group:
Marilyn E. Jacox and Dolphus E. Milligan
Group:
Gordon H. Dunn, Lee J. Kieffer, Stephen J. Smith.

Stratton Award—Robert P. Madden

Rosa Award—Paul R. Achenbach

International Astronomical Union, Special Award; naming of moon craters after NBS scientists—William W. Coblentz (1873-1962; tenure at NBS, 1905-45); J. Howard Dellinger (1886-1962; tenure at NBS, 1907-48); Hugh L. Dryden (1898-1965; tenure at NBS, 1918-47); Nicholas E. Golovin (1912-69; tenure at NBS 1949-58); William F. Meggers (1888-1966; tenure at NBS 1914-58); Paul W. Merrill (1887-1961; tenure at NBS, 1916-18).

1971
Gold Medal Awards—
Lawrence H. Bennett
Martin J. Berger
Bascom W. Birmingham
Arthur A. Maryott
W. Wayne Meinke
John B. Wachtman
Wolfgang L. Wiese
Group:
Everett G. Fuller, Evans V. Hayward

Federal Woman's Award—Joan R. Rosenblatt

Stratton Awards—
Group:
Richard L. Barger, John L. Hall
Group:
John I. Lauritzen, Elio Passaglia, Edmund DiMarzio.

Rosa Award—Judson C. French

1972
Gold Medal Awards—
Ruth M. Davis
Myron G. Domsitz
Jerome Kruger
James R. McNesby
Lewis V. Spencer

Federal Woman's Award—Ruth M. Davis

Stratton Award—Kenneth M. Evenson

Rosa Award—Emanuel Horowitz

1973
Gold Medal Awards—
Wolfgang K. Haller
David M. Kerns
John I. Lauritzen
John Mandel
Hideo Okabe

Federal Woman's Award—Marilyn E. Jacox

Stratton Award—
Group:
Marilyn E. Jacox and Dolphus E. Milligan

Rosa Award—Henry J. Kostkowski

Rockefeller Public Service Award—Ruth M. Davis

National Aeronautics and Space Administration, Special Awards—
NASA Exceptional Scientific Achievement Medal for Apollo missions 11, 14, 15—James E. Faller
NASA Exceptional Scientific Achievement Medal for Lunar Ranging Experiment—
Group:
James E. Faller, Peter L. Bender

1974
Flemming Award—David G. Hummer

Gold Medal Awards—
Ernest M. Levin
James E. Skillington, Jr.
Group;
Stanley Block, Gasper J. Piermarini.
Group:
Richard L. Barger, Bruce L. Danielson, Gordon W. Day, Kenneth M. Evenson, John L. Hall, F. Russell Petersen, Joseph S. Wells.

Stratton Award—Richard D. Deslattes

Rosa Award—John K. Taylor

Condon Award—Russell D. Young

1975

Gold Medal Awards—
Paul R. Achenbach
James A. Barnes
Gerhard M. Brauer
Donald G. Fletcher
Emanuel Horowitz
Philip S. Klebanoff
Melvin R. Meyerson
Edward J. Prosen
John A. Simpson
F. Karl Willenbrock
James R. Wright
Group;
Robert A. Kamper, James E. Zimmerman.

Stratton Award—John B. Wachtman, Jr.

Rosa Award—William C. Cullen

Condon Award—Johanna M.H. Levelt Sengers

Applied Research Award—Dicky D. Davis

1976

Gold Medal Awards—
Pierre J. Ausloos
J. Paul Cali
James M. Cassel
Alan J. Goldman
Alexander F. Robertson
Joan R. Rosenblatt
Group:
Glenn F. Engen, Cletus A. Hoer

Federal Woman's Award—Evans V. Hayward

Stratton Award—
Group:
James W. Lightbody, Samuel Penner.

Rosa Award—J. Paul Cali

Condon Award—
Group:
Ralph P. Hudson, Harvey Marshak, Robert J. Soulen, Jr., Donald B. Utton.

Applied Research Award—Gregory J. Rosasco

1977

Flemming Award—Donald R. Johnson

Gold Medal Awards—
Margarete Ehrlich
Alan C. Gallagher
John T. Hall
Melvin Linzer
John W. Lyons
Donald D. Wagman
Group:
Donald R. Johnson, Frank J. Lovas.

Stratton Award—Sheldon M. Wiederhorn

Rosa Award—Wilfrid B. Mann

Condon Award—Robert A. Kamper

Applied Research Award—Anthony J. Barbera

President's Award for Distinguished Federal Civilian Service—Ernest Ambler

National Civil Service League, Career Service Award—Ruth M. Davis

1978

Gold Medal Awards—
Walter Braun
Thomas D. Coyle
Judson C. French
Kurt F.J. Heinrich
Johanna M.H. Levelt Sengers

Stratton Award—
Group:
Theodore E. Madey, John T. Yates, Jr.

Rosa Award—Alexander F. Robertson

Condon Award—Roy G. Saltman

Applied Research Award—Melvin Linzer

1979

Flemming Award—J. William Gadzuk

Gold Medal Awards—
Martin G. Broadhurst
Randall S. Caswell
Richard D. Deslattes
George G. Harman, Jr.
Morris Krauss
Philip D. LaFleur
William L. McLaughlin
Group:
James F. Schooley, Robert J. Soulen, Jr.

Stratton Award—James E. Zimmerman

Rosa Award—Louis Costrell

Condon Award—
Group:
Kenneth M. Evenson, David J. Wineland, Helmut Hellwig, John L. Hall.

Applied Research Award—Marshall D. Abrams

1980

Gold Medal Awards—
Dennis K. Branstad
Frederick E. Brinckman, Jr.
Lucy M. Cavallo
Ared Cezairliyan
William C. Cullen
Jon T. Hougen
Tamami Kusuda
Arthur G. Maki, Jr.
Robert E. Michaelis
Group:
Robert E. Edsinger, Leslie A. Guildner

Stratton Award—Evans V. Hayward

Rosa Award—W. Murray Bullis

Condon Award—
Group:
Robert J. Celotta, Daniel T. Pierce.

Applied Research Award—
Group:
John A. Simpson, Robert J. Hocken, William C. Haight.

1981

Gold Medal Awards—
Burton H. Colvin
Robert D. Cutkosky
J. William Gadzuk
Ernest E. Hughes
Harry H. Ku
Theodore E. Madey
William C. Martin
John T. Yates, Jr.

Stratton Award—
Group:
David M. Kerns, Allen C. Newell

Rosa Award—James A. Grundl

Condon Award—Donald G. McDonald

Applied Research Award—
Group:
C. McKay Allred, Glenn F. Engen, Cletus A. Hoer, Manly P. Weidman

Measurement Services Awards—
Woodward G. Eicke, Jr.
Robert R. Jones

1982

Flemming Award—Jon C. Geist

Gold Medal Awards—
John W. Cahn
Judah Levine
Sheldon M. Wiederhorn
Richard N. Wright
Group:
Richard D. Marshall, Edward O. Pfrang

Stratton Award—Jerome Kruger

Rosa Award—Elmer H. Eisenhower

Condon Award—Theodore E. Madey

Applied Research Award—Donald G. Eitzen

Measurement Services Award—
Group:
Robert W. Peterson, Linwood Jenkins.

1983

Gold Medal Awards—
Robert P. Blanc
David Garvin
Clark A. Hamilton
Raymond G. Kammer
Raymond D. Mountain
Richard P. Reed
Group:
James L. Blue, Charles L. Wilson.
Group:
J. Michael Rowe, John J. Rush.

Stratton Award—Martin G. Broadhurst

Rosa Award—Robert L. Scace

Condon Award—Isaac C. Sanchez

Applied Research Award—
Group:
David W. Allan, Alvin J.D. Clements, Dicky D. Davis, Marc A. Weiss.

Measurement Services Awards—
Gerald J. Harris
Jacquelyn A. Wise

1984

Gold Medal Awards—
Michael Danos
James J. Filliben
Peter L.M. Heydemann
Stephen R. Leone

Stratton Award—Morris Krauss

Rosa Awards—
John F. Heafner
Bradford M. Smith

Condon Award—Brian R. Lawn

Applied Research Award—Karla L. Hoffman

Astin Award—
Group:
Karl G. Kessler, John A. Simpson

1985

Gold Medal Awards—
Pierre J. Ausloos
Howard J.M. Hanley
Sharon G. Lias
John C. Stephenson
Group:
Howard R. Baum, Ronald G. Rehm
Group:
James C. Bergquist, John J. Bollinger, Wayne M. Itano, David J. Wineland.

Stratton Award—
Group:
Richard L. Kautz, Donald B. Sullivan.

Rosa Award—Robert Schaffer

Condon Award—David J. Wineland

Applied Research Award—William L. McLaughlin

Astin Award—Albert D. Tholen

1986

Flemming Awards—
Stephen R. Leone
Harry S. Hertz

Gold Medal Awards—
James S. Albus
André Deprit
Charles C. Han
Robert J. Hocken
Dale E. Newbury
Cedric J. Powell
Robert S. Roth
Mabel V. Vickers

Stratton Award—John W. Cahn

Rosa Award—George A. Uriano

Condon Award—John W. Lyons

Applied Research Award—
Group:
Ronald F. Fleming, Robert G. Downing.

Astin Award—Norman B. Belecki

1987

Flemming Awards—
Willie E. May
Dale E. Newbury

Gold Medal Awards—
David A. Didion
Steve R. Domen
Michael R. Moldover
Raymond T. Moore
Philip N. Nanzetta
James J. Rhyne
Jack E. Snell
Francis E. Sullivan
Robb M. Thomson
Wing Tsang
Group:
Robert J. Celotta, Daniel T. Pierce.

Stratton Award—William D. Phillips

Rosa Award—Daniel Gross

Condon Award—Kermit C. Smyth

Applied Research Award—David A. Didion

Astin Award—Roger E. Beehler

1988

Flemming Award—William D. Phillips

Gold Medal Awards—
Robert J. Carpenter
Douglas L. Franzen
Arnold H. Kahn
Curt W. Reimann
Stephen E. Stein

Stratton Award—Michael R. Moldover

Rosa Award—Samuel J. Schneider, Jr.

Condon Award—
Group
David A. Didion, Mark O. McLinden.

Applied Research Award—Douglas L. Franzen

Astin Award—William C. Daywitt

1989

Gold Medal Awards—
George Birnbaum
Lloyd A. Currie
Harold E. Nelson
Joseph Reader
Emil Simiu
Group:
D. Wayne Hanson, David A. Howe, James L. Jesperson.
Group:
James A. Beall, Clark A. Hamilton, Richard E. Harris, Richard L. Kautz, Frances L. Lloyd.
Group:
Marvin E. Cage, Ronald F. Dziuba, P. Thomas Olsen, John Q. Shields, Barry N. Taylor, Edwin R. Williams.

Stratton Award—
Group
James C. Bergquist, John J. Bollinger, Wayne M. Itano, David J. Wineland.

Condon Award—Gregory B. McKenna

Rosa Award—Leonard Mordfin

Applied Research Award—James S. Albus

Astin Award—Mary C. Croarkin

1990

Flemming Award—Geoffrey B. McFadden

Gold Medal Awards—
Richard R. Cavanagh
James E. Faller
Katherine B. Gebbie
Oskars Petersons
Walter J. Stevens

Stratton Award—Charles C. Han

Rosa Award—Frank F. Oettinger

Condon Award—George G. Harman, Jr.

Applied Research Award—Howard M. Kingston

Astin Award—Group; Robert J. Carpenter, Alan Mink, George G. Nacht, John W. Roberts.

1991
Flemming Award—David J. Nesbitt

Gold Medal Awards—
David S. King
Billy W. Mangum
Geoffrey B. McFadden
Edward Prince
Tawfik M. Raby

Stratton Award—
Group:
Michael P. Casassa, Richard R. Cavanagh, Edwin J. Heilweil, David S. King, John C. Stephenson.

Rosa Award—Randall S. Caswell

Condon Award—Dale E. Newbury

Applied Research Award—Takashi Kashiwagi

Astin Award—Ronald F. Dziuba

1992
Flemming Award—Eric B. Steel

Gold Medal Awards—
Willie E. May
George A. Uriano
Wen-Li Wu

Stratton Award—Stephen R. Leone

Rosa Award—Vytenis Babrauskas

Applied Research Award—
Group:
Mark O. McLinden, Graham Morrison.

Astin Award—William C. Martin

Slichter Award—
Group:
Robert J. Celotta, Daniel T. Pierce.

1993
Gold Medal Awards—
William D. Phillips
Group:
Robert E. Drullinger, David J. Glaze, John P. Lowe.
Group:
High-Temperature Superconducting Electronics Team.

Stratton Award—
Group:
J. Michael Rowe, John J. Rush.

Condon Award—Charles R. Tilford

Rosa Award—
Group:
Dennis J. Reeder, Kristy L. Richie.

Applied Research Award—
Group:
Laurie Locasio-Brown, Steven J. Choquette.

Astin Award—
Group:
W. Tyler Estler, Yun Hsia Queen.

Slichter Award—
Group:
Stephen A. Osella, Theodore V. Vorburger, Pedro I. Espina, George E. Mattingly, Francis S. Biancaniello, Paul A. Boyer, Robert L. Parke, Stephen D. Ridder, H. Thomas Yolken.

Sources:
1968-1973 NBS Standard.
1974-1993 NBS/NIST Award Brochure Collection.

APPENDIX H

MEMBERS OF THE VISITING COMMITTEE FOR NBS AND THE VISITING COMMITTEE ON ADVANCED TECHNOLOGY FOR NIST

Public Law 56-177, which established the National Bureau of Standards as an agency of the Department of the Treasury on March 3, 1901, directed the creation of a Visiting Committee of five members, "men prominent in the various interests involved", to be appointed by the Secretary of the Treasury, to visit NBS at least annually, and to report to the secretary upon the efficiency of its scientific work and the condition of its equipment. Despite the transfer of NBS to the Department of Commerce and Labor in 1903 and the creation in 1913 of a separate Department of Commerce, the procedures of the Visiting Committee remained unchanged until 1988.

The text of Public Law 100-418, August 23, 1988, replaced the earlier Visiting Committee by a Visiting Committee on Advanced Technology (VCAT). The new committee, to be appointed by the NIST Director, was to be composed of nine members, at least five of whom were to be from U.S. industry. The VCAT was to meet at least quarterly and to provide an annual report on NIST, to be submitted to Congress through the Secretary of Commerce.

Visiting Committee, National Bureau of Standards

Albert Ladd Colby — 1901-1907
Consulting engineer in metallurgy, South Bethlehem, Pennsylvania, and secretary, Association of American Steel Manufacturers.

Elihu Thomson — 1901-1918
Electrical engineer, General Electric Company, Lynn, Massachusetts.

Ira Remsen — 1901-1909
Director of Chemical Laboratory and President, John Hopkins University.

Henry S. Pritchett — 1901-1910
President, Massachusetts Institute of Technology; later, President, Carnegie Foundation for the Advancement of Teaching.

Edward L. Nichols — 1901-1911
Professor of physics, Cornell University.

Robert S. Woodward — 1908-1912
President, Carnegie Institution of Washington.

Henry M. Howe — 1909-1914
Professor of metallurgy, Columbia University.

Arthur G. Webster — 1910-1915
Director, Physics Laboratory, Clark University.

John F. Hayford — 1912-1921
Director, College of Engineering, Northwestern University.

Arthur E. Kennelly — 1912-1917
Professor of electrical engineering, Harvard University.

John R. Freeman — 1915-1924; 1926-1931
Consulting engineer, Providence, Rhode Island.

William A. Noyes — 1915-1920
Director, Chemical Laboratory, University of Illinois.

Joseph S. Ames — 1917-1922
Director, Physical Laboratory, Johns Hopkins University.

Wilder D. Bancroft — 1920-1925
Professor of physical chemistry, Cornell University.

Fred W. McNair — 1921-1923
President, Michigan College of Mines (1921-23).

Ambrose Swasey — 1921-1926
Chairman of the Board, Warner & Swasey Company, Cleveland, Ohio.

Samuel W. Stratton — 1923-1931
President, Massachusetts Institute of Technology.

Gano Dunn — 1923-1948
President, J.G. White Engineering Corporation, New York.

William F. Durand — 1924-1929
Professor of mechanical engineering, Leland Stanford University.

Willis R. Whitney — 1925-1930
Director, General Electric Research Laboratory, Schenectady, New York.

Charles F. Kettering — 1929-1934; 1947-1952
Director of Research and Vice President, General Motors Corporation.

Charles L. Reese — 1930-1935
Consulting chemist to E.I. du Pont de Nemours & Company.

Morris E. Leeds — 1931-1941
President, Leeds & Northrup Co., Philadelphia, Pennsylvania.

Karl T. Compton — 1931-1947
President, Massachusetts Institute of Technology.

William D. Coolidge — 1935-1949
Vice President and Director of Research, General Electric Company.

Frank B. Jewett — 1935-1945
Vice President for Research & Development, American Telephone & Telegraph Co.; President, National Academy of Sciences.

Vannevar Bush — 1942-1946
President, Carnegie Institution of Washington; Director, Office of Scientific Research and Development.

Harold C. Urey 1945-1950
Research Professor of chemistry, University of Chicago.

Eugene P. Wigner 1946-1951
Metallurgical Laboratory, University of Chicago; Director of Research, Clinton Laboratories, Oak Ridge, Tennessee.

Robert F. Mehl 1948-1953
Director, Metals Research Laboratory, Carnegie Institute of Technology.

Donald H. Menzel 1949-1954
Chairman, Department of astronomy, Harvard University; Associate Director, Harvard Observatory.

Detlev W. Bronk 1950-1960
President, Johns Hopkins University.

John H. Van Vleck 1951-1956
Dean, Division of Applied Science, Harvard University.

Mervin J. Kelly 1952-1962
President, Bell Telephone Laboratories.

Clyde E. Williams 1953-1958
Director, Battelle Memorial Institute, Columbus, Ohio.

Crawford H. Greenewalt 1954-1964
President, E.I. du Pont de Nemours & Company.

Frederick Seitz 1956-1961
Chairman, Department of Physics, University of Illinois.

Lloyd V. Berkner 1958-1965
President, Associated Universities, New York; President, Southwest Graduate Research Center.

Charles H. Townes 1960-1965
Professor, Department of physics, Columbia University; consultant, Brookhaven National Laboratories.

Emanuel R. Piore 1962-1972
Vice President and Chief Scientist, International Business Machines Corporation.

Elmer W. Engstrom 1963-1971
President, Radio Corporation of America.

Paul C. Cross 1964-1969
President, Mellon Institute.

Norman F. Ramsey 1965-70; 1982-1987
Professor, Department of physics, Harvard University.

Robert L. Sproull 1966-1971
Vice President, University of Rochester.

Jack E. Goldman 1969-1974
Senior Vice President for Research and Development, Xerox Corporation.

James C. Fletcher 1970-1971
President, University of Utah.

H. Guyford Stever 1971-1976
President, Carnegie Mellon University.

Milton Harris 1971-1973
President, Harris Research Laboratories, Incorporated.

Arthur M. Bueche 1971-1975
Vice-President for Research and Development, General Electric Company.

John G. Truxall 1972-1976
Dean, College of Engineering, State University of New York at Stony Brook.

Charles E. Peck 1973-1977
Vice-President, Construction Group, Owens-Corning Fiberglas Corporation.

Edwin A. Gee 1973-1978
Senior Vice President, E.I. du Pont de Nemours & Company; International Paper Corporation.

Robert H. Dicke 1974-1979
Professor of physics, Princeton University.

W. Dale Compton 1975-1981
Vice-President for Research, Ford Motor Company.

William D. Carey 1976-1981
Executive Officer, American Association for the Advancement of Science.

William K. Linvill 1978-1982
Department of engineering economics, Stanford University.

Dorothy M. Simon 1978-1983
Vice-President for Research, AVCO Corporation.

Walter H. Stockmayer 1979-1984
Department of chemistry, Dartmouth College.

G. King Walters 1980-1982; 1992-1994
Dean, Physics Department, Rice University.

Russell G. Meyerand, Jr. 1980-1985
Vice-President for Technology, United Technologies Corporation.

Bernard M. Oliver 1982-1986
Vice-President, Hewlett Packard Company.

Robert H. Pry 1983-1987
Center for Innovative Technology; Consultant, Gould Incorporated.

William D. Manly 1984-1989
Senior Vice-President, Cabot Corporation; Consultant, Oak Ridge National Laboratory.

Arden L. Bement 1985-1991
Vice-President, Technical Resources, Science & Technology Department, TRW Incorporated.

The Visiting Committee on Advanced Technology, National Institute of Standards and Technology

William D. Manly 1988-1989
Senior Vice-President, Cabot Corporation; Consultant, Oak Ridge National Laboratory.

Arden L. Bement 1988-1991
Vice-President, Technical Resources, Science & Technology Department, TRW Incorporated.

John G. Bollinger 1988-1991
Dean, College of Engineering, University of Wisconsin.

John P. McTague 1988-1990
Vice-President for Research, Ford Motor Company.

Nolen M. Ellison 1988-1989
President, Cuyahoga Community College.

Jeanette G. Grasselli 1988-1991
Director of Research Enhancement, Ohio University.

William J. Spencer 1988-1989
Vice-President for Corporate Research, Xerox Corporation.

William P. Slichter 1988-1990
Executive Director, Materials Science and Engineering Division, AT&T Bell Laboratories.

William G. Howard Jr. 1988-1993
Senior Fellow, National Academy of Engineering.

Edward C. Heffron 1990-1993
Director, Food Division, Michigan Department of Agriculture.

Albert R.C. Westwood 1990-1995
Vice-President for Research and Technology, Martin Marietta Corporation.

Richard S. Nicholson 1990-1992
Executive Officer, American Association for the Advancement of Science.

Nam P. Suh 1990-1993
Professor of manufacturing and of mechanical engineering, Massachusetts Institute of Technology.

Robert W. Lucky 1991-1994
Vice-President for Applied Research, Bellcore Corporation.

Robert J. Hermann 1992-1998
Senior Vice President for Science and Technology, United Technologies Corporation.

Edward M. Chait 1992-1994
Vice-President for Business Development, Intergen Company.

Maxine L. Savitz 1993-1999
General Manager for Ceramic Components, Allied Signal, Incorporated.

Fred W. Kittler Jr. 1994-2000
Vice President, J. P. Morgan Investment Management Company.

Robert J. Saldich 1994-2000
President, Raychem Corporation.

George M. Whitesides 1994-1997
Professor of chemistry, Harvard University.

Craig I. Fields 1995-2001
Vice Chairman, Alliance Gaming Corporation.

James C. McGroddy 1995-2001
Senior Vice President, IBM Corporation.

Howard D. Samuel 1995-2000
Senior Fellow, Council on Competitiveness.

David L. Tennenhouse 1996-1997
Principal Research Scientist, MIT Laboratory for Computer Science.

Duane A. Adams 1996-1999
Vice Provost for Research, Carnegie Mellon University.

Dwight D. Carlson 1996-1999
Vice Chairman, Perceptron, Incoporated.

Victoria F. Haynes 1996-1999
Vice President for Research & Development, The B.F. Goodrich Company.

Lynn R. Williams 1996-2000
President (Retired), United Steel Workers of America.

Milton M. Chang 1996-
Chairman, New Focus, Incorporated.

(Dates indicate term(s) of appointments.)

Source:
Carolyn J. Stull, NIST Visiting Committee Office.

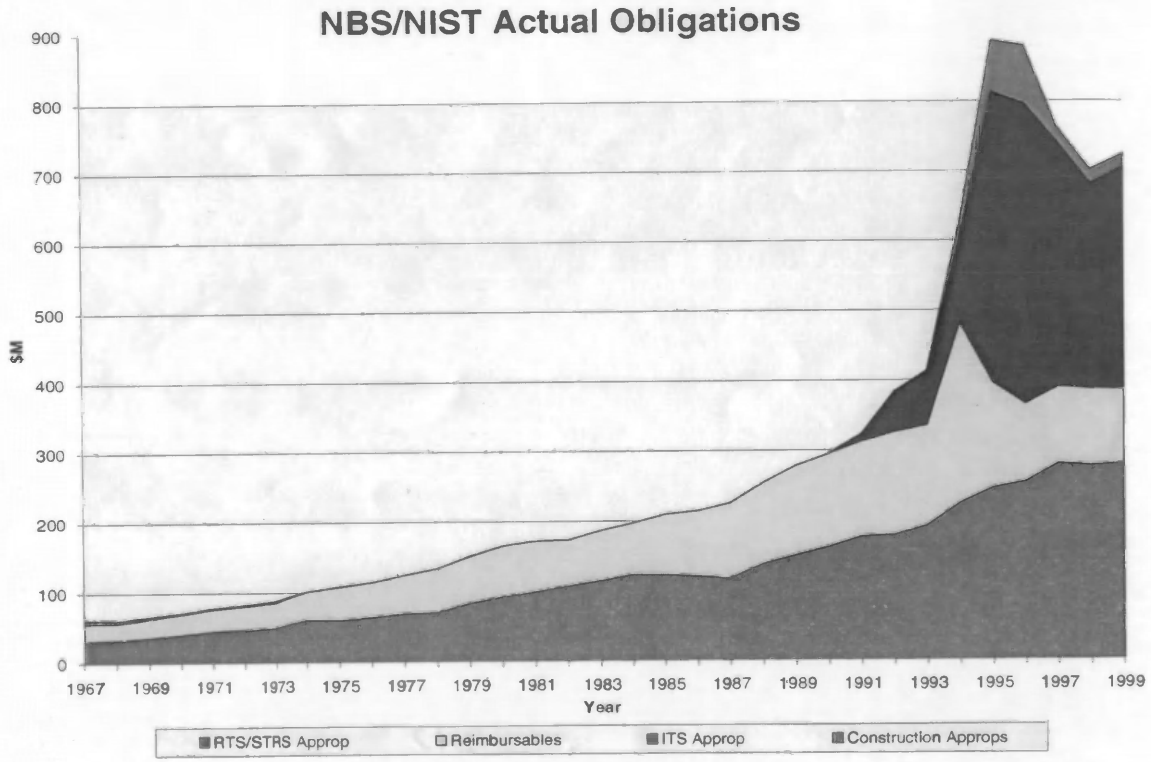
APPENDIX I

NBS/NIST ACTUAL OBLIGATIONS, 1967-1999

On the following page is presented, in graphical form, a representation of monies spent by NBS/NIST during the period 1967-1999. Four categories of expenditure are indicated:

- Congressionally appropriated funds earmarked for NBS/NIST Research and Technical Services (RTS) or Scientific and Technical Research and Services (SRTS). During the stated period, these funds—used primarily to support scientists engaged in traditional NBS work—grew from $30 M per year to $280 M per year.
- Funds obtained principally from other government agencies for research services rendered, from the sale of Standard Reference Materials, and from calibration services (Reimbursables). Funds received from these sources grew from $25 M per year to just over $70 M per year during 1967-1999.
- Congressionally appropriated funds earmarked for support of the Advanced Technology Program and the Manufacturing Extension Partnership (ITS Approp). Existing only after the change of NBS to NIST, these funds reached peak levels above $400 M per year during 1995 and 1996.
- Congressionally appropriated funds earmarked for new construction and major renovations of NIST facilities (Construction Approps). These funds reached peak levels above $70 M during 1995 and 1996.

Source: Janet B. Miller, Chief, Formulation and Financial Management Section, NIST Budget Division.


NBS/NIST Actual Obligations
900
800
700
600
500
400
300
200
100
0
$M
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
Year
RTS/STRS Approp
Reimbursables
ITS Approp
Construction Approps

APPENDIX J

NBS/NIST PUBLICATIONS

This appendix contains a listing of both periodical and non-periodical publications from NBS/NIST. Many of the publications enjoyed only a limited life, then were superseded or stopped.

Besides the publications listed here, NBS/NIST scientists and engineers wrote numerous books and book chapters, edited many technical conference proceedings, and published many archival technical papers in non-NBS/NIST journals. References to these publications can be found in NBS Circular 460 and its supplement (for the years 1901-1957); in NBS Miscellaneous Publication 240 and its supplement (1957-1966); and NBS/NIST Special Publication 305 and its many supplements (1966--present).

In 1991, total NIST Publications numbered over 1,700 separate items.

Following each entry is its NIST Office of Information Services call number.

Aeronautic Instruments Circulars
TL589.U47
No. 1-51 (1918-1921)

These technical circulars discussed the principles involved in the various aeronautic instruments and the methods of testing employed by the Aeronautic Instruments Section. The confidential reports were duplicated for temporary use and served to make the results immediately available for the instruction of the experts engaged in aviation work in the technical divisions of the Army and Navy. They were not for publication.

Aeronautic Power Plants Reports
TL521.A33
No. 3-53 (1918-1919)

These technical reports were results of investigations by the NBS Airplane Power Plant Section for the National Advisory Committee for Aeronautics. The reports were confidential for use by the Army, Navy, and authorized civilians.

Annual Reports
QC100.U55
Fiscal Year 1902–Fiscal Year 1985

The title varies and includes:

Annual Report of the Director of the National Bureau of Standards for the Fiscal Year Ended . . . (June 30, 1902–June 30, 1903)

Annual Report of the Director of the Bureau of Standards to the Secretary of Commerce and Labor for the Fiscal Year Ended . . . (June 30, 1904–June 30, 1912)

Annual Report of the Director, Bureau of Standards to the Secretary of Commerce for the Fiscal Year Ended . . . (June 30, 1913–June 30, 1921)

Annual Report of the Director of the Bureau of Standards to the Secretary of Commerce for the Fiscal Year Ended . . . (June 30, 1922 –June 30, 1932)

Reprinted from the Annual Report of the Secretary of Commerce. Bureau of Standards. (1933)

Reprinted from the Annual Report of the Secretary of Commerce. National Bureau of Standards. (1934-1942)

The *Annual Reports of the National Bureau of Standards* for the fiscal years 1943, 1944, and 1945 were not published because of economy measures taken during World War II. The manuscripts for these annual reports were submitted to the secretary of commerce in typewritten form.

Annual Report of the National Bureau of Standards. Reprinted from the Annual Report of the Secretary of Commerce. (1946-1948)

Annual Report . . . National Bureau of Standards. (1949-1952)

Biennial Report 1953 and 1954, National Bureau of Standards. From the Preface: At the scheduled time for the preparation and release of the 1953 report the Bureau was undergoing comprehensive survey by an Ad Hoc Committee [Kelly Committee] appointed by the secretary of commerce to "evaluate the present functions and operation of the NBS in relation to present national needs." A number of important changes affecting the over-all Bureau program were made as a result of this survey. It was considered more appropriate to delay the report for a year in order to include the complete recommendations of the Ad Hoc Committee rather than to report on them partially.

Annual Report . . . National Bureau of Standards. (1955-1957)

Research Highlights of the National Bureau of Standards. Annual Report, Fiscal Year . . . (1958-1963)

Technical Highlights of the National Bureau of Standards. Annual Report, Fiscal Year . . . (1964-1970)

NBS 1971 Annual Report. Special Publication (SP) 397 June 1972

National Bureau of Standards, NBS. (1972) SP-367 Oct 1972

National Bureau of Standards, NBS. [1973] SP-397 June 1974

NBS Annual Report Fiscal Year 1974. SP-418 March 1975

National Bureau of Standards Annual Report FY 1975. SP-437 Dec 1975

National Bureau of Standards, Perspectives on Standards. (1976) SP-467 March 1977

Science on it's Way to Work, Activities of the National Bureau of Standards. [1977] SP-498 April 1978

National Bureau of Standards, A National Resource for Science and Technology, Fiscal Year 1978. SP-538 July 1979

1979 was not published.

National Bureau of Standards 1980. SP-600 Jan 1981

National Bureau of Standards 1982. [covered fiscal years 1981 and 1982] SP-643 Feb 1983

National Bureau of Standards. [1983] SP-679 July 1984

National Bureau of Standards. [1985] SP-679 July 1984, revised April 1986.

The last annual report in this series was published in 1986 as a revision of the previous report. The two publications differ in all but a few minor areas.

Descriptions of the technical activities of the major organizational units of NBS/NIST—but without overall personnel or financial information—were published in a series of Special Publication documents during the period 1984 to the present. Prominent among these were the following series:

NIST Research Reports 1984-1987;

NIST Research Reports 1988-1991; and

Guide to NIST 1993- present.

Applied Mathematics Series

QA3.U5

No. 1-63 (1948-1973)

This series contains mathematical tables, manuals and studies of special interest to physicists, engineers, chemists, biologists, mathematicians and others engaged in scientific and technical work. Some of the publications are reissues of the Mathematical Tables prepared by members of the Project for the Computation of Mathematical Tables. This series is inactive as none have been published since 1973.

Basic Radio Propagation Predictions Series

This monthly series was prepared by the Interservice Radio Propagation Laboratory (IRPL) which was set up during WWII by the United States Joint Communications Board at NBS. The series succeeded "Radio Propagation Conditions," also prepared by the IRPL. The predictions series was initially restricted and available only to the military as a basic supplement to the IRPL's "Radio Propagation Handbook" issued by the military. Predictions were made three months in advance. May 1, 1946, the wartime IRPL ceased to exist and its duties and functions were assumed by the Central Radio Propagation Laboratory (CRPL) of the National Bureau of Standards. In July 1946 the series was made available by annual subscription to those concerned with radio communication in determining the best sky-wave frequencies over any path at any time of day for average conditions. In September 1947, various maps, charts, diagrams, and nomograms needed to make practical application of the world-contour charts were added with examples of their use.

Basic Radio Propagation Predictions, IRPL Series D
TK6570.B7U47
No. 1-22 (1944-June 1946)
Continued by: Basic Radio Propagation Predictions, CRPL Series D

Basic Radio Propagation Predictions, CRPL Series D
TK6570.B7U47
No. 23-220 (July 1946-1962)
Continues: Basic Radio Propagation Predictions, IRPL Series D
Superseded by: Ionospheric Predictions

Building and Housing
TH1.U4
No. 1-18 (1923-1932)

This series contained reports of the work of the Building and Housing Division that included gathering and distributing scientific, practical, statistical, and other information tending to reduce costs, and encourage and improve construction and housing. It covered investigations for use in framing local building and plumbing codes, and a study of problems connected with city zoning. Information on the prices, production, consumption, and stocks of building materials, and on building activity was collected, analyzed, and distributed. Special attention was paid to factors bearing on the housing problem. The work included studies of building practices, and cooperative efforts to reduce seasonal operations and otherwise eliminate waste in the construction industries.

Building Materials and Structures Reports
TA410.U48
No. 1-152 (1938-1959)

This series reported the results of Bureau investigations on the properties and suitability of new materials and new methods of construction. The program was carried out with the cooperation and advice of the housing agencies of the Government. The objective was to furnish the Government, the building industry, and the public with technical information that would be useful with particular reference to low-cost housing. This series was discontinued in July 1959 and papers on building technology were then published in the *Journal of Research*—usually *Section C. Engineering and Instrumentation*—or the Monograph series.

Building Science Series *see* NIST Building Science Series

Bulletin of the Bureau of Standards *see* Journal of Research

Circulars *see* National Bureau of Standards Circular

Commercial Standards
QC100.U5553
Nos. 0-274 (1928-1966)

Commercial standards were voluntary, recorded standards agreed upon by producers, distributors, and consumers, covering terminology, types, classifications, grades, sizes, and use characteristics of manufactured products as a basis for better understanding between buyers and sellers. They generally included standard methods of test, rating, certification, and labeling, and provided a uniform basis for fair competition. Each standard included a list of members of the standing committee, a history of the project, and list of acceptors. After 1966 as *Commercial Standards* were revised, they became *Product Standards* and in 1969, *Voluntary Product Standards.*

Commercial Standards Monthly
HD62.U3
Vol. [1]-9 (1925-1933)

This periodical was a review of progress in commercial simplification and standardization. It covered the national movement initiated by President Hoover for the reduction of needless sizes and varieties of products and the promotion of voluntary commercial standardization by industry.

Consumer Information Series
TX335.A1U6
No. 1-10 (1970-1978)

This series contained practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace. This series is inactive as none have been published since 1978.

CRPL Report
QC503.U5
No. 1-1 – 9-10 (July 1946-1950)
Supersedes: IRPL Report

Reports prepared by the Central Radio Propagation Laboratory at NBS.

CRPL-F, Part A: Ionospheric Data

These bulletins represent a variety of data collected by IRPL, later CRPL, in the course of its research and service activities. The data were made available for use in research on radio propagation and the ionosphere, and in other geophysical applications.

Ionospheric Data, IRPL-F
QC503.U5
No. 1-22 (1944 – June 1946)
Continued by: Ionospheric Data, CRPL-F

Ionospheric Data, CRPL-F
QC503.U5
No. 23-134 (July 1946-1955)
Continues: Ionospheric Data, IRPL-F
Split into two parts: CRPL-F, Part A and CRPL-F, Part B

CRPL-F, Part A: Ionospheric Data
QC503.U5
No. 135-256 (1955-1965)
Continues in part: Ionospheric Data, CRPL-F
Continued as U.S. Environmental Science Services Administration. Institute for Telecommunication Sciences. CRPL-FA: Ionospheric Data

CRPL-F, Part B: Solar-Geophysical Data
QC503.U51
No. 135-256 (1955-1965)
Continues in part: Ionospheric Data, CRPL-F
Continued as U.S. Environmental Science Services Administration. Institute for Telecommunication Sciences. CRPL-FB: Solar-Geophysical Data

Dimensions

During World War I the Bureau originally issued the *Confidential Bulletin* as an information bulletin for the military of ordnance work done by the Bureau. The name was changed to *Technical News Bulletin* (TNB) and the first issue, no. 26, June 20, 1919, was also issued as *Confidential Bulletin* no. 26, June 20, 1919. These two publications were the same except for information items concerning ordnance that were blanked out of the TNB.

The *Technical News Bulletin,* available by annual subscription, summarized the current research, development, and test activities of the Bureau. The articles were brief, with emphasis on the results of research and their significance, chosen for their importance to other scientists, engineers, and to industry. Resumes of longer research reports, important national and international conferences on fundamental science in which the Bureau represented the Nation, and a bibliography of all publications by members of the staff as published were included. The Bulletin was designed to give a succinct account of the current work of the Bureau.

Dimensions continued the TNB in a popular magazine format to inform scientists, engineers, businessmen, industry, teachers, students, and consumers of the latest advances in science and technology, with primary emphasis on the work at NBS. It highlighted and reviewed such issues as energy research, fire protection, building technology, metric conversion, pollution abatement, health and safety, and consumer product performance in addition to Bureau programs in measurement standards and techniques, properties of matter and materials, engineering standards and services, instrumentation, and automatic data processing.

Confidential Bulletin
T1.U45
No. 1-26 (Dec. 15, 1917–June 20, 1919)
Continued by: Technical News Bulletin of the Bureau of Standards

Technical News Bulletin of the Bureau of Standards
T1.U45
No. 26-204 (1919-1934)
Continued by: Technical News Bulletin of the National Bureau of Standards

Technical News Bulletin of the National Bureau of Standards
T1.U45
No. 205– Vol. 57 no. 7 (May 1934–July 1973)
(after no. 356, Dec. 1946, changed to volume numbering with Vol. 31 no. 1, Jan. 1947)
Continues: Technical News Bulletin of the Bureau of Standards
Continued by: Dimensions: the Magazine of the National Bureau of Standards

Dimensions: the Magazine of the National Bureau of Standards
T1.U45
Vol. 57 no. 8–Vol. 65 no. 8 (Aug. 1973–Oct. 1981)
Continues: Technical News Bulletin of the National Bureau of Standards
Additional title: Dimensions/NBS

Federal Information Processing Standards Publications
JK468.A8A3
No. 0 (1968)–present

This series is the official publication relating to standards and guidelines developed for Federal computer systems by the National Institute of Standards and Technology and promulgated under the Federal Property and Administrative Services Act of 1949, Section 111(d), as amended by the Computer Security Act of 1987, Public Law 100-235 (101 Stat. 1724) January 8, 1988.

Federal Specifications

The Bureau developed specifications for the purchase of supplies (other than foods and drugs) for the Federal Government. These specifications were generally recognized as dependable guides by many large organizations and purchasing agencies in achieving purchasing economy. The Bureau endorsed these specifications and published them for distribution. The first one published by the Bureau was Circular 13, *Standard Specifications for the Purchase of Carbon-Filament Incandescent Lamps,* in 1907. The first official U.S. Government specification, authorized by Presidential order, was published as Bureau Circular C33, *United States Government Specification for Portland Cement,* in 1912. Specifications were published in the Circular and Miscellaneous Publications series.

In 1921 The Federal Specifications Board was created by the Bureau of the Budget to unify specifications already available to government agencies. Bureau specifications accepted by the Board became official standards and were binding on all departments of the Federal Government.

Gage Section Communications
TJ1166.U5
1919-1920

The various communications of the Gage Section of the Weights and Measures Division contained information about the practical problems of gauges and gauging methods including work carried out with the National Screw Thread Commission.

Handbooks *see* NIST Handbooks

Hydraulic Laboratory. Bulletin. Series B: Hydraulic Laboratories in the United States
TC1.U5
(1933 and 1935, 1st rev.)

This series updated *Hydraulic Laboratories in the United States of America,* giving descriptions of 47 hydraulic laboratories in the United States.

Hydraulic Research in The United States

These reports represented a cooperative attempt on the part of the hydraulic laboratories in the United States to bring about the effective interchange of information relating to research projects being carried out in these laboratories. NBS served as a central agency to compile, publish and distribute information related to current hydraulic laboratory research.

Hydraulic Laboratory. Bulletin. Series A: Current Hydraulic Laboratory Research in the United States
TC1.U51
No. 1-10 (1933-1942)
Continued by: *Hydraulic Research in the United States*

Hydraulic Research in the United States
TC1.U51
Vol. 11-14 (1947-1950)
Continues: Hydraulic Laboratory. Bulletin. Series A: Current Hydraulic Laboratory Research in the United States

In 1951 *Hydraulic Research in the United States* became part of the Miscellaneous Publications series, and an annual issue was published, keeping the title *Hydraulic Research in the United States.* In 1969 the series name changed to Special Publications and the frequency of publication of *Hydraulic Research* became biennial. In 1972 the title changed to *Hydraulic Research in the United States and Canada.* Publication of this title ended in 1978.

Miscellaneous Publications 201, 205, 208, 210, 215, 218, 221, 224, 227, 231, 238, 245, 249, 261, 270, 280
Special Publications 316, 346, 382, 443, 497, 583

International Aircraft Standards
TL671.1.U5
(1917-1918)

International Aircraft Standards, adopted by the International Aircraft Standards Board, were specifications that resulted from testing done at NBS. The classification of specifications covered general inspection and testing instructions, raw materials, fabricated material, and fabricated parts.

Ionospheric Predictions
TK6570.B7U47
No. 1-36 (1963-1965)
Supersedes: Basic Radio Propagation Predictions, CRPL Series D

The CRPL *Ionospheric Predictions* were issued monthly as an aid in determining the best sky-wave frequencies over any transmission path, at any time of day, for average conditions for the month. Issued three months in advance, each issue provided tables of numerical coefficients that defined the functions describing the predicted worldwide distribution of foF2 and M(3000)F2 and maps for each even hour of Universal Time of MUF(Aero)F2 and MUF(4000)F2.

IRPL Report
TK6540.U5
No. 1-35 (1943-June 1946)
Superseded by: CRPL Report

Reports prepared by the Interservice Radio Propagation Laboratory at NBS.

Journal of Physical and Chemical Reference Data
Q199.J65
Vol. 1 (1972)– present

This journal provides critically evaluated physical and chemical property data and critical reviews of measurement techniques. It is not an outlet for original experimental measurements or for review articles of a descriptive or primarily theoretical nature. The National Standard Reference Data System is one source of contributions to the Journal. JPCRD is published by the American Chemical Society and the American Institute of Physics for NIST.

JOURNAL OF RESEARCH

Results of research in science and technology were reported in the *Scientific Papers*. The first 14 volumes of the *Scientific Papers* were issued as the *Bulletin of the Bureau of Standards* and the separate papers were called "Reprints." Results of investigations of materials and methods of testing were reported in the *Technologic Papers*. In July 1928 the *Scientific Papers* and *Technologic Papers* were combined and issued under the title *Bureau of Standards Journal of Research*.

Complete scientific reports of the Bureau's research and development, both experimental and theoretical, in physics, chemistry, and engineering and the results of test and instrumentation activities in these fields were printed in the *Journal of Research*. The subject matter of the reports embraced all fields of work conducted at the Bureau. *Research Papers* were reprints of individual articles appearing in the monthly issues of the *Journal of Research*. They were made available in this form to serve the need of research workers, technical groups, and others for the separate papers relating to the particular subjects in which they cooperated or were interested. In July 1959 the Bureau began publishing the Journal in four separate sections, A, B, C, and D, and the *Research Papers* were discontinued. Issued six times a year.

Journal of Research of the National Bureau of Standards, Section A. Physics and Chemistry was of interest primarily to scientists working in these fields. It covered a broad range of physical and chemical research, with major emphasis on standards of physical measurement, fundamental constants, and properties of matter. Issued six times a year.

Journal of Research of the National Bureau of Standards, Section B. Mathematics and Mathematical Physics presented studies and compilations designed mainly for the mathematician and the theoretical physicist. Topics in mathematical statistics, theory of experiment design, numerical analysis, theoretical physics and chemistry, logical design and programing of computers and computer systems were covered, together with short numerical tables. In 1967 *Mathematics and Mathematical Physics* changed to *Mathematical Sciences*. Issued quarterly.

Journal of Research of the National Bureau of Standards, Section C. Engineering and Instrumentation reported research and development results of interest chiefly to the engineer and the applied scientist. It included many of the new developments in instrumentation resulting from the Bureau's work in physical measurement, data processing, and development of test methods. It also covered some of the work in acoustics, applied mechanics, building research, and cryogenic engineering. Issued quarterly. Ceased publication at end of 1972.

Journal of Research of the National Bureau of Standards, Section D. Radio Propagation reported research in radio propagation, communications, and upper atmospheric physics. Topics covered included propagation in ionized media, scattering by turbulence, effect of irregular terrain on propagation, diffraction and scattering by solid obstacles, propagation through time-varying media, surface waves, and antennas. In January 1964, *Radio Propagation* changed to *Radio Science*. Issued six times a year.

Journal of Research of the National Bureau of Standards, Section D. Radio Science was published monthly by the National Bureau of Standards in cooperation with the U.S. National Committee of the International Scientific Radio Union (URSI). It served as the principal publication outlet for the research of the NBS Central Radio Propagation Laboratory and the scientific activities of the USNC of URSI; it also carried selected papers from the NBS Radio Standards Laboratory. *Radio Science* presented research papers, as well as occasional survey articles, in radio propagation, communications, and radio science generally. Beginning with the January 1966 issue, *Radio Science* was published by the Environmental Science Services Administration (ESSA) after the transfer of the Central Radio Propagation Laboratory from NBS to ESSA. The scope and coverage remained the same. It continued to be cosponsored by the U.S. National Committee of the International Scientific Radio Union. The title of the journal was changed to simply *Radio Science* with new volume numbering.

In July 1977 Sections A and B were combined under its former title *Journal of Research of the National Bureau of Standards* and issued six times a year.

As of August 23, 1988, the National Bureau of Standards (NBS) became the National Institute of Standards and Technology (NIST) when the Omnibus Trade and Competitiveness Act was signed into law. The title was changed to *Journal of Research of the National Institute of Standards and Technology* with the Volume 93, no. 6 (November-December 1988) issue to reflect the organizational name change.

Bulletin of the Bureau of Standards
QC1.U5
Vol. 1-14 (1904-1919)

Scientific Papers of the Bureau of Standards
QC1.U572
Vol. 15-22 (1919-1928)
Merged with: Technologic Papers of the Bureau of Standards, to form: Bureau of Standards Journal of Research

Technologic Papers of the Bureau of Standards
T1.U4
Vol. 1-22 (1910-1928)
Merged with: Scientific Papers of the Bureau of Standards, to form: Bureau of Standards Journal of Research

Bureau of Standards Journal of Research
QC1.U52
Vol. 1-12 (1928-1934)
Formed by the union of: Scientific Papers of the Bureau of Standards, and Technologic Papers of the Bureau of Standards
Continued by: Journal of Research of the National Bureau of Standards

Journal of Research of the National Bureau of Standards
QC1.U52
Vol. 13-62 (1934-1959)
Continues: Bureau of Standards Journal of Research
Split into four parts and continued by Sections A, B, C, and D

Journal of Research of the National Bureau of Standards. Section A: Physics and Chemistry
QC1.U522
Vol. 63A-81A (1959-1977)
Continues in part: Journal of Research of the National Bureau of Standards
Merged with: Journal of Research of the National Bureau of Standards. Section B, to form: Journal of Research of the National Bureau of Standards

Journal of Research of the National Bureau of Standards. Section B: Mathematics and Mathematical Physics
QA1.U57
Vol. 63B-71B (1959-1967)
Continues in part: Journal of Research of the National Bureau of Standards
Continued by: Journal of Research of the National Bureau of Standards. Section B: Mathematical Sciences

Journal of Research of the National Bureau of Standards. Section B: Mathematical Sciences
QA1.U57
Vol. 72B-81B (1968-1977)
Continues: Journal of Research of the National Bureau of Standards. Section B: Mathematics and Mathematical Physics
Merged with: Journal of Research of the National Bureau of Standards. Section A, to form: Journal of Research of the National Bureau of Standards

Journal of Research of the National Bureau of Standards. Section C: Engineering and Instrumentation
QC100.U5554
Vol. 63C-76C (1959-1972)
Continues in part: Journal of Research of the National Bureau of Standards
Ceased publication in 1972.

Journal of Research of the National Bureau of Standards. Section D: Radio Propagation
QC973.U46
Vol. 63D-67D (1959-1963)
Continues in part: Journal of Research of the National Bureau of Standards
Continued by: Journal of Research of the National Bureau of Standards. Section D: Radio Science

Journal of Research of the National Bureau of Standards. Section D: Radio Science
QC973.U46
Vol. 68D-69D (1964-1965)
Continues: Journal of Research of the National Bureau of Standards. Section D: Radio Propagation
Ceased publication by NBS in 1965.

Journal of Research of the National Bureau of Standards
QC1.U524
Vol. 82-93 no. 5 (1977-1988)
Formed by the union of its Sections A and B
Continued by: Journal of Research at the National Institute of Standards and Technology

Journal of Research of the National Institute of Standards and Technology
QC1.U524
Vol. 93 no. 6 (1988)–present
Continues: Journal of Research of the National Bureau of Standards

LETTER CIRCULARS

Letter Circulars 1-1040 are mimeographed, irregularly published lists of Bureau publications and references, and general information concerning specific subjects on which popular interest had been demonstrated by inquiries addressed to the Bureau. With no. 1041 (1966) the Letter Circulars changed from a report format to that of brochures, booklets, and charts. They are still an informal series and not subject to a review process.

Letter Circular of the Bureau of Standards
QC100.U5775
No. 1-411 (1921-1934)

Letter Circular of the National Bureau of Standards
QC100.U5775
No. 412–1040 (1934-1962)
No. 1041–1134 (1966-1984).

Letter Circular of the National Institute of Standards and Technology
QC100.U5775
No. 1135 (1988) – present.

Limitation of Variety Recommendations
No. 1 (September 1, 1924)

Apparently only one "Elimination of Waste–Limitation of Variety Recommendation" was published (listed in "Publications of the Bureau of Standards, 1901–June 30, 1925," 7th ed. final, pg. 215. Circular no. 24) No mention of this series is made in the "Supplementary List of Publications of the Bureau of Standards, (July 1, 1925, to December 31, 1931)" or any thereafter.

Mathematical Tables Series
QA47.U51
No. 1-37 (1939-1946)

The tables (with the exception of MT15) were prepared by the Mathematical Tables Project for the computation of mathematical tables. The project, conducted by the Federal Works Agency, Work Projects Administration (WPA) for the city of New York, was under the sponsorship of, and tables made available through, the National Bureau of Standards. Selected for tabulation were functions of fundamental importance in pure and applied mathematics in the most useful range and interval of the argument. They are of special interest to physicists, engineers, chemists, biologists, mathematicians and others engaged in scientific and technical work.

In 1943 the project was administratively transferred from the WPA to the Bureau, but it remained in New York. When the National Applied Mathematics Laboratories was established at NBS in July 1947, the Mathematical Tables Project moved from New York to Washington, DC and became a part of the NAML's Computation Laboratory.

MT-18, MT-30, and MT-37 were originally printed as part of the series in the "Bulletin of the American Mathematical Society".

MT-19—MT-29, and MT-31—MT-36 were originally printed as part of the series in the "Journal of Mathematics and Physics".

Miscellaneous Publications *see* NIST Special Publications

Monographs *see* Monographs

NATIONAL BUREAU OF STANDARDS CIRCULARS

Circulars were compilations of information on various subjects related to the Bureau's scientific, technical, and engineering activities. They included not only the results of Bureau studies, but give data of general interest from other sources.

This series also contained *Recommended Specifications, United States Government Specifications,* and *United States Government Master Specifications* formerly issued by the Bureau. These bore a specification number in addition to the Bureau Circular number, but all of these specifications were canceled or superseded by *Federal Specifications,* now formulated by the Federal Specifications Board. The series was discontinued in June 1959 and "circular" material was directed to the *Journal of Research* and the Monograph series.

Circular of Information of the National Bureau of Standards
QC100.U554
No. 1-4 (1902-1903)
Continued by: Bureau Circular—Department of Commerce and Labor, Bureau of Standards

Bureau Circular—Department of Commerce and Labor, Bureau of Standards
QC100.U555
No. 1-20 (1903-1909)
Continues: Circular of Information of the National Bureau of Standards
Continued by: Circular of the Bureau of Standards

Circular of the Bureau of Standards
QC100.U555
No. 21-404 (1910-1934)
Continues: Bureau Circular—Department of Commerce and Labor, Bureau of Standards
Continued by: Circular of the National Bureau of Standards

Circular of the National Bureau of Standards
QC100.U555
No. 405-459 (1934-1948)
Continues: Circular of the Bureau of Standards
Continued by: National Bureau of Standards Circular

National Bureau of Standards Circular
QC100.U555
No. 460-603 (1947-1959)
Continues: Circular of the National Bureau of Standards
Superseded by: NBS Monograph

National Bureau of Standards Reports
Nos. 1000-10,987 (1951-1975)

These were usually preliminary or progress accounting documents intended for use within the government. Before material in the reports was formally published, it was subjected to additional evaluation and review. The reports were often called "graybacks" because of their gray covers.

NBS-GCR Reports
QC100.U6N25
70-1 to 88-550 (1970-1988).

NBS-GCR Reports
QC100.U6N25
88-551 to present.

Grantee/Contractor reports are prepared by non-NIST persons or organizations working under grant or contract from NIST.

NBS-GCR-ETIP Reports
73-01—82-101 (1973-1982)

Grantee/Contractor reports prepared by non-NBS persons or organizations working under grant or contract from NBS on subjects specifically for the Experimental Technology Incentives Program.

NBS Standard
T1.U44 Vol. 1—vol. 26, no. 15 (October 1955-July 22, 1981)

This publication was the official NBS employee newsletter. All department of commerce individual agency newsletters were discontinued in 1981 as part of the secretary of commerce's goal to develop a more unified and cohesive department. The assistant secretary for administration established an employee newsletter to cover the entire Department of Commerce.

NIST Building Science Series

This series disseminates technical information developed at NIST on building materials, components, systems, and whole structures. The series contains research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems.

Building Science Series
TA435.U58
No. 0-49 (1965-1974)
Continued by: NBS Building Science Series

NBS Building Science Series
TA435.U58
No. 50-165 (1974-1987)
Continues: Building Science Series
Continued by: NIST Building Science Series

NIST Building Science Series
TA435.U58
No. 166 (1989)—present
Continues: NBS Building Science Series

NIST Handbooks

These are recommended codes of engineering and industrial practice, including safety codes, developed in cooperation with the national organizations and others concerned. In many cases the recommended requirements are given official status through their incorporation in local ordinances by State and municipal regulatory bodies.

Handbook of the Bureau of Standards
QC1.U51
No. 1-18 (1918-1934)
Continued by: NBS Handbook

NBS Handbook
QC1.U51
No. 19-145 (1934-1986)
Continues: Handbook of the Bureau of Standards
Continued by: NIST Handbook

NIST Handbook
QC1.U51
No. 146 (1989)–present
Continues: NBS Handbook

NIST Monographs

Monographs are usually contributions to the technical literature which are too lengthy for publication in the *Journal of Research*. They often provide extensive compilations of information on subjects related to the Bureau's technical program. Until July 1959 most of this type of material was published in the Circular series.

NBS Monograph
QC100.U556
No. 1-174 (1959-1986)
Supersedes: National Bureau of Standards Circular
Continued by: NIST Monograph

NIST Monograph
QC100.U556
No. 175 (Approved 1990)—present.
Continues: NBS Monograph

NIST Special Publications

The Miscellaneous Publications series included material, which, because of its character or because of its size, did not fit into any of the other regular publication series. Some of these were charts, administrative pamphlets, directories of specifications, annual reports, weights and measures conference reports, and other subjects appropriate to this series. In 1968, the series title changed to Special Publication.

Miscellaneous Publication—Bureau of Standards
QC100.U57
No. 1-132 (1918-1933)
Continued by: Bureau of Standards Miscellaneous Publication

Bureau of Standards Miscellaneous Publication
QC100.U57
No. 133-144 (1932-1934)
Continues: Miscellaneous Publication–Bureau of Standards
Continued by: Miscellaneous Publication–National Bureau of Standards

Miscellaneous Publication–National Bureau of Standards
QC100.U57
No. 145-294 (1934-1967)
Continues: Bureau of Standards Miscellaneous Publication
Continued by: NBS Special Publication

NBS Special Publication
QC100.U57
No. 295-749 (1968-1988)
Continues: Miscellaneous Publication—National Bureau of Standards
Continued by: NIST Special Publication

NIST Special Publication
QC100.U57
No. 750 (1988)—present
Continues: NBS Special Publication

NIST Technical Notes

This series was initiated in 1959 to supplement the Bureau's regular publications program. Technical Notes provide a means for making available scientific data that are of transient or limited interest.

NBS Technical Note
QC100.U5753
No. 1-1321 (1959-1988)
Continued by: NIST Technical Note
Nos. 1250-1299, 1310, 1318 published as NIST Technical Notes.

NIST Technical Note
QC100.U5753
No. 1250 (1988)—present
Continues: NBS Technical Note
Nos. 1300-1309, 1311-1317, 1319-1321 published as NBS Technical Notes.

NISTIR

This is a special series of interim or final reports on work performed by NIST for outside sponsors (both government and nongovernment).

NBSIR
QC100.U56
No. 73-101—88-3836 (1973-1988)

NISTIR
QC100.U56
NO. 88-3837 (1988)—present

NSRDS-NIST

The National Standard Reference Data Series provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. It was developed under a worldwide program coordinated by NBS, under authority of the National Standard Data Act (Public Law 90-396). This series supplements the *Journal of Physical and Chemical Reference Data.*

NSRDS-NBS
QC100.U573
No. 1-73 (1964-1987)
Continued by: NSRDS-NIST

NSRDS-NIST
QC100.U573
As of 7/7/99, nothing has been published in the NSRDS-NIST series.
Continues: NSRDS-NBS

Photographic Laboratory Circulars
TR395.U5
No. 1-2 (????-1920)

These were confidential reports of NBS tests for government agencies that were done in the Photographic Laboratory.

Planning Report
QC100.U5P5
No. 1 (1980)– present

These are internal reports but shared with government or private agencies. The reports are prepared by the NBS/NIST Program Office or by private contractors.

Product Standards *see* Voluntary Product Standards

Projects and Publications of the Applied Mathematics Division: a Quarterly Report

These were reports on the research and services of Division 11, the National Applied Mathematics Division.

Activities in Applied Mathematics
QA27.U5A31
(1946-1947)
Continued by: Projects and Publications of the National Applied Mathematics Laboratories: a Quarterly Report

Projects and Publications of the National Applied Mathematics Laboratories: a Quarterly Report
QA27.U5A32
(1947-1954)
Continues: Activities in Applied Mathematics
Continued by: Projects and Publications of the Applied Mathematics Division: a Quarterly Report

Projects and Publications of the Applied Mathematics Division: a Quarterly Report
QA27.U5A32
(1954-1964)
Continues: Projects and Publications of the National Applied Mathematics Laboratories: a Quarterly Report

Reference Data Reports

This was an informal communication of the National Standard Reference Data System (NSRDS) for the exchange of news and ideas about data centers, publications, meetings, and other activities related to data evaluation and dissemination. It ceased publication in April 1983.

NSRDS News
QC100.U57315
Issues for June 1966-May 1973 were originally published in the *Technical News Bulletin;* not published Nov. 1974-Apr. 1975, Mar., June-Aug. 1976
June 1973—Nov./Dec. 1976
Superseded by: Reference Data Report

Reference Data Report
QC100.U57315
Vol. 1-7 (1977-April 1983)
Other title: NSRDS Reference Data Report
Supersedes: NSRDS News

Reports *see* National Bureau of Standards Reports

Scientific Papers of the Bureau of Standards *see* Journal of Research

Simplified Practice Recommendations
QC100.U564
No. 1-80 (1922-1928)
(1928-1966)

"Simplified Practice," in this series, meant reduction of excessive variety of manufactured products, or of methods. Simplified Practice Recommendations were records of stock items retained after superfluous variety had been eliminated. These recommendations were developed by voluntary cooperation among manufacturers, distributors, consumers, and others interested, through a regular procedure of the National Bureau of Standards established for that purpose—a procedure designed to insure not only the initial success of a program, but also its continued adjustment to meet changing industrial conditions.

Each printed booklet contained not only the specific recommendation itself, but also its history and development, the names of trade associations, firms, individuals, and others that approved the recommendation, and the personnel of the standing committee in charge of its maintenance and revisions as needed to keep them current with developments. The date from which each recommendation was effective was given. Beginning in 1966 as they were revised, Simplified Practice Recommendations changed to Product Standards and later to Voluntary Product Standards.

Standards Yearbook
QC100.U576
(1927-1933)

This publication gave a summary of progress in the field of standardization in agencies, both governmental and private, throughout the world. The yearbook was originally designed as a companion volume to "Commerce Yearbook." The seven volumes were published as Miscellaneous Publications 77, 83, 91, 106, 119, 133, 139 but titled Standards Yearbook.

Technical Information on Building Materials for Use in the Design of Low Cost Housing
TH1.U5
No. 1-61 (1936-1938)

These releases presented, very briefly, essential facts developed through research work at NBS and refer to longer publications where methods of investigation and results obtained were given in greater detail. They were prepared principally for the guidance of architectural and engineering staffs of federal agencies in the selection of materials for use in low-cost housing.

Technical Notes *see* NIST Technical Notes

Technologic Papers of the Bureau of Standards *see* Journal of Research

VOLUNTARY PRODUCT STANDARDS

This series provides requirements for sizes, types, quality and methods for testing various industrial products. These standards are developed cooperatively with interested government and industry groups, provide the basis for common understanding of product characteristics for both buyers and sellers, and are used voluntarily. Voluntary Product Standards include Commercial Standards (material requirements and quality criteria) and Simplified Practice Recommendations (sizes, models, and dimensions of commonly stocked items) revised since 1966. They are developed under procedures published by the Department of Commerce in Part 10, Title 15, of the "Code of Federal Regulations." The purpose of these standards is to establish nationally recognized requirements for products, and to provide all concerned interests with a basis for common understanding of the characteristics of the products. The National Institute of Standards and Technology administers the Voluntary Product Standards program as a supplement to the activities of the private sector standardizing organizations.

In 1979, private standards-writing organizations were encouraged by the Department of Commerce to develop voluntary product standards and it announced the withdrawal of all Voluntary Product Standards sponsored by NBS. Sponsorship of the standards was transferred to other institutions or private standards-writing organizations, or the standards were withdrawn. As of September 1997, three Voluntary Product Standards are still sponsored by NIST, but on a cost-reimbursable basis by private organizations.

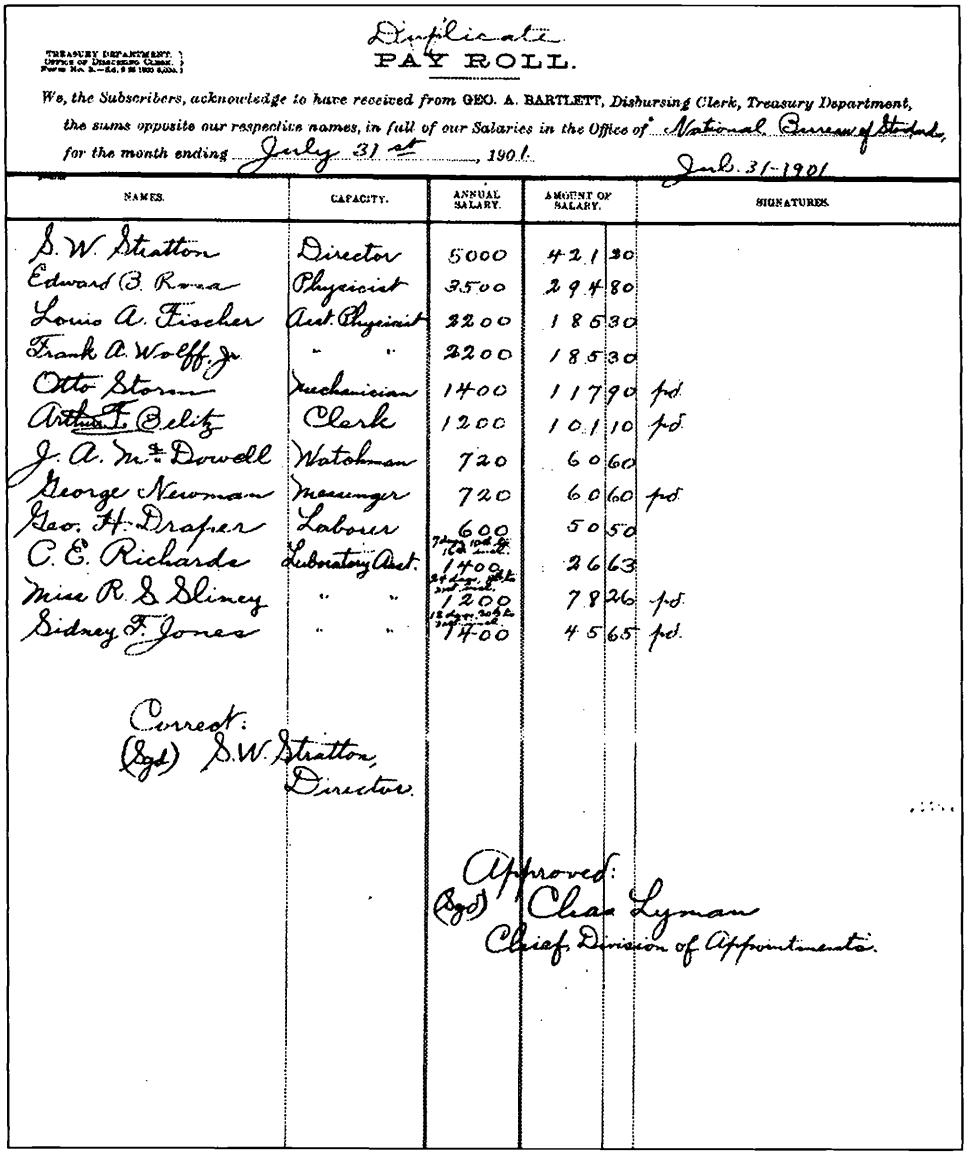
Product Standards
QC100.U563
No. 0-13 (1966-1969)
Continued by: Voluntary Product Standards

Voluntary Product Standards
QC100.U563
No. 14 (1969)—present
Continues: Product Standards

APPENDIX K

STRUCTURE AND LEADERSHIP OF NBS/NIST

Substantial changes in the NBS/NIST administrative structure occurred over the years 1901-1991. These changes are illustrated here by selections from the organizational charts for the years 1905, 1920, 1930, 1940, 1950, 1954, 1964, 1978, and 1991.



Duplicate.

TREASURY DEPARTMENT, OFFICE OF DISBURSING CLERK.

PAY ROLL.

We, the Subscribers, acknowledge to have received from GEO. A. BARTLETT, Disbursing Clerk, Treasury Department, the sums opposite our respective names, in full of our Salaries in the Office of National Bureau of Standards, for the month ending July 31st, 1901.

July. 31-1901

NAMES.	CAPACITY.	ANNUAL SALARY.	AMOUNT OF SALARY.	SIGNATURES.
S. W. Stratton	Director	5000	421 20	
Edward B. Rosa	Physicist	3500	294 80	
Louis A. Fischer	Asst. Physicist	2200	185 30	
Frank A. Wolff Jr.	" "	2200	185 30	
Otto Storm	Mechanician	1400	117 90	pd
Arthur F. Belitz	Clerk	1200	101 10	pd
J. A. McDowell	Watchman	720	60 60	
George Newman	Messenger	720	60 60	pd
Geo. H. Draper	Laborer	600	50 50	
C. E. Richards	Laboratory Asst.	1400	26 63	
Miss R. S. Sliney	" "	1200	78 26	pd
Sidney F. Jones	" "	1400	45 65	pd

Correct:
(Sgd) S. W. Stratton,
Director.

Approved:
(Sgd) Clara Lyman
Chief, Division of Appointments.

One of the first official payrolls of NBS, July 1901.

The Bureau structure on July 1, 1905 showed the rapid progress made by Director Samuel Stratton in creating a core structure for NBS.

JULY 1, 1905

DIRECTOR	Dr. Samuel W. Stratton
WEIGHTS AND MEASURES	Louis A. Fischer
Comparison of Capacities	Roy Y. Ferner
Weights and Measures Assistant	Arthur T. Pienkowsky
HEAT AND THERMOMETRY	Dr. Charles W. Waidner
Low Temperature Investigations	Dr. Charles W. Waidner
High Temperature Investigations	Dr. George K. Burgess
Comparison of Thermometers	Dr. Hobart C. Dickinson
Heat and Thermometry Assistant	Eugene F. Mueller
LIGHT AND OPTICAL INSTRUMENTS	Dr. Samuel W. Stratton
Spectroscopy	Dr. Perley G. Nutting
Magneto-Optics	Frederick J. Bates
Computer	Dr. William W. Coblentz
ENGINEERING INSTRUMENTS AND MATERIALS	Charles F. Sponsler
Engineering Instruments and Materials Assistants	Albert S. Merrill
	Oscar G. Lange
ELECTRICITY	Dr. Edward B. Rosa
Inductance and Capacity	Dr. Edward B. Rosa
	Dr. Frederick W. Grover
Magnetism and Absolute Measurements of Current	Dr. Karl E. Guthe
Electrical Measuring Instruments	Herbert B. Brooks
	Dr. Morton G. Lloyd
	Clarence E. Reid
Photometry	Dr. Edward P. Hyde
Electrical Resistance and Electromotive Force	Dr. Frank A. Wolff
	Dr. George W. Middlekauff
Electricity Assistants	Francis E. Cady
	Franklin S. Durston
	Dr. N. Ernest Dorsey
	Maynard P. Shoemaker
Naval Radio Research Laboratory	Dr. Louis W. Austin
Army Signal Service Radio Laboratory	E.R. Cramm
CHEMISTRY	Dr. William A. Noyes
Chemistry Assistants	Dr. Henry N. Stokes
	Dr. John R. Cain
	Campbell E. Waters

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The Bureau structure on January 1, 1920 showed the increased breadth of its program near the end of Samuel Stratton's tenure and after strenuous contributions to military technology during World War I.

JANUARY 1, 1920

DIRECTOR	Dr. Samuel W. Stratton
Technical Assistant to the Director	Dr. Fay C. Brown
I. ELECTRICAL	Dr. Edward B. Rosa
Standards of Resistance	Dr. Frank Wenner
Inductance and Capacity	Dr. Harvey L. Curtis
Electrical Measuring Instruments	Dr. Herbert B. Brooks
Magnetic Measurements	Raymond L. Sanford
Photometry and Illuminating Engineering	Dr. A. Hadley Taylor
Radio Research and Testing	Dr. J. Howard Dellinger
Radio Development	Frederick A. Kolster
Electrolysis Prevention	Burton McCollum
Safety Engineering	Dr. Morton G. Lloyd
Gas Engineering	Russell S. McBride
Electrical Service Standards	Dr. J. Franklin Meyer
Telephone Service Standards	Dr. Frank A. Wolff
Electrochemistry	Dr. George W. Vinal
Radioactivity and X-ray Measurements	Dr. N. Ernest Dorsey
II. WEIGHTS AND MEASURES	Louis A. Fischer
Length	Dr. Lewis V. Judson
Mass	Dr. Arthur T. Pienkowsky
Time	Arthur F. Beal
Capacity and Density	Elmer L. Peffer
Gas Measuring Instruments	Marcus H. Stillman
Thermal Expansivity	Dr. Wilmer Souder
Weights and Measures Laws and Administration	Fay S. Holbrook
Investigation and Testing of Scales	Fay S. Holbrook
Gages	Henry W. Bearce
III. HEAT AND THERMOMETRY	Dr. Charles W. Waidner
Thermometry	Robert M. Wilhelm
Pyrometry	Dr. Paul D. Foote
Heat Measurements	Eugene F. Mueller
Thermodynamics	Dr. Edgar Buckingham
Cryogenic Laboratory	Clarence W. Kanolt
Fire Resistance	Simon H. Ingberg
Airplane and Automotive Power Plant	Dr. Hobart C. Dickinson
IV. LIGHT AND OPTICAL INSTRUMENTS	Dr. Clarence A. Skinner
Spectroscopy	Dr. William F. Meggers
Polarimetry	Frederick J. Bates
Colorimetry	Irwin G. Priest
Refractometry and Optical Instruments	Harry I. Schultz
Radiometry	Dr. William W. Coblentz
Dispersoids	Dr. Philip V. Wells
Photographic Technology	Planned
Interferometry	Chauncey G. Peters
Searchlight Investigations	Enoch Karrer

V. Chemistry	Dr. William F. Hillebrand
Physical Chemistry	Dr. Cyril S. Taylor
Electrochemistry	Dr. William Blum
Metallurgical Chemistry	Dr. John R. Cain
Gas Chemistry	Elmer R. Weaver
Reagents and Apparatus	Frederick W. Smither
Analytical Methods, Standard Samples	Dr. Gustave E.F. Lundell
Oils, Rubber, Paper, etc.	Campbell E. Waters
Metals, Cement, Bituminous Materials	Samuel S. Voorhees
Paint, Varnish, Soap	Dr. Percy H. Walker
VI. Engineering Physics	Dr. Samuel W. Stratton
Mechanical Appliances	Philip L. Wormeley
Engineering Instruments	Walter F. Stutz
Aviation Instruments	Dr. Mayo D. Hersey
Aviation Physics	Dr. Lyman J. Briggs
Special Investigations (Sound)	John F. Hayford
VII. Engineering, Structural, and Miscellaneous Materials	Dr. Samuel W. Stratton
Metal Structures	Herbert L. Whittemore
Cement, Sand, Stone, etc.	Joseph C. Pearson
Rubber, Leather, etc.	Philip L. Wormeley
Textiles	Frank R. McGowan
Paper	Frederick A. Curtis
Lubricating Oils	Dr. Winslow H. Herschel
Lime, Gypsum, Sand, Brick	Warren E. Emley
VIII. Metallurgy	Dr. George K. Burgess
Microscopy of Metals	Dr. Henry S. Rawdon
Heat Treatment and Thermal Analysis	Herbert J. French
Physical Properties of Metals	Dr. George K. Burgess
Chemical Metallurgy	Dr. John R. Cain
Foundry and Mechanical Plant	Carydon P. Karr
IX. Ceramics	Dr. Albert V. Bleininger
Clay Products	Dr. Albert V. Bleininger
Optical Glass	William H. Taylor
Refractories	Homer F. Staley
Enameled Metal Products	Homer F. Staley
X. Miscellaneous (Sound)	Dr. Englehardt A. Eckhardt

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By April 1, 1930, George K. Burgess had further expanded the Bureau's horizon, particularly in the area of building construction.

APRIL 1, 1930

DIRECTOR	Dr. George K. Burgess
Assistant Director for Research and Testing	Dr. Lyman J. Briggs
Assistant Director for Commercial Standardization	Dr. Addams S. McAllister
I. Electrical	Dr. Eugene C. Crittendon
Resistance Measurements	Dr. Frank Wenner
Inductance and Capacitance	Dr. Harvey L. Curtis
Electrical Instruments	Dr. Herbert B. Brooks

Magnetic Measurements	Raymond L. Sanford
Photometry	Dr. J. Franklin Meyer
Radio	Dr. J. Howard Dellinger
Underground Corrosion	Kirk H. Logan
Safety Standards	Dr. Morton G. Lloyd
Electrochemistry	Dr. George W. Vinal
Telephone Standards	Dr. Frank A. Wolff
II. Weights and Measures	Fay S. Holbrook and Henry W. Bearce
Length	Dr. Lewis V. Judson
Mass	Dr. Arthur T. Pienkowsky
Time	Ralph E. Gould
Capacity and Density	Elmer L. Peffer
Gas Measuring Instruments	Howard S. Bean
Thermal Expansivity	Dr. Wilmer Souder
Weights and Measures Laws and Administration	Ralph W. Smith
Railroad Scales and Test Cars	Fay S. Holbrook
Gages	David R. Miller
III. Heat and Power	Dr. Hobart C. Dickinson
Thermometry	Johanna Busse
Pyrometry	Dr. Henry T. Wensel
Heat Measurements	Eugene F. Mueller
Heat Transfer	Dr. Milton S. VanDusen
Cryogenic Laboratory	Dr. Ferdinand G. Brickwedde
Fire Resistance	Simon H. Ingberg
Automotive Power Plant	Herbert K. Cummings
Friction and Lubrication	Dr. Mayo D. Hersey
IV. Optics	Dr. Clarence A. Skinner
Spectroscopy	Dr. William F. Meggers
Polarimetry	Frederick J. Bates
Colorimetry	Irwin G. Priest
Optical Instruments	Dr. Irvine C. Gardner
Radiometry	Dr. William W. Coblentz
Atomic Physics, Radium, X-Rays	Dr. Fred L. Mohler
Photographic Technology	Raymond Davis
Interferometry	Chauncey G. Peters
V. Chemistry	Dr. Edward W. Washburn
Physico-Chemical Research	Dr. Edward W. Washburn
Paints, Varnish, Bituminous Materials	Dr. Percy H. Walker
Detergents, Cement, Corrosion	Frederick W. Smither
Rubber, Lubricants, Textiles	Campbell E. Waters
Metal and Ore Analysis, Standard Samples	Dr. Gustave E. F. Lundell
Reagents and Platinum Metals	Dr. Edward Wichers
Electrochemistry	Dr. William Blum
Gas Chemistry	Elmer R. Weaver

VI. Mechanics and Sound	Dr. Lyman J. Briggs
Engineering Instruments and Mechanical Appliances	Walter F. Stutz
Sound	Dr. Paul R. Heyl
Aeronautic Instruments	Dr. William G. Brombacher
Aerodynamic Physics	Dr. Hugh L. Dryden
Engineering Mechanics	Herbert L. Whittemore
Hydraulic Laboratory	Herbert N. Eaton
VII. Organic and Fibrous Materials	Warren E. Emley
Rubber	Philip L. Wormeley
Textiles	William D. Appel
Paper	Bourdon W. Scribner
Leather	Roy C. Bowker
VIII. Metallurgy	Dr. Henry S. Rawdon
Optical Metallurgy	Dr. Henry S. Rawdon
Thermal Metallurgy	Dr. Ralph L. Dowdell
Mechanical Metallurgy	William H. Swanger
Chemical Metallurgy	Louis Jordan
Experimental Foundry	Charles M. Saeger, Jr.
IX. Clay and Silicate Products	Phaon H. Bates
Whiteware	Roman F. Geller
Glass	Alfred N. Finn
Refractories	Raymond A. Heindl
Enamels	William N. Harrison
Heavy Clay Products	Ray T. Stull
Cement and Concrete Materials	John Tucker, Jr.
Masonry Construction	Douglas E. Parsons
Lime and Gypsum	James A. Murray
Stone	Daniel W. Kessler
X. Simplified Practice	Edwin W. Ely
Stone, Clay, and Glass	Herbert R. Colwell
Wood, Textiles, and Paper	George Schuster
Metal Products and Construction Materials	Peter H. H. Dunn
Containers	William E. Braithwaite
Promotion and Adherence	Alexander B. Galt
XI. Building and Housing	James S. Taylor
Building Codes	George N. Thompson
Building Practice and Homebuilders' Problems	Vincent B. Phelan
City Planning and Zoning	James S. Taylor
Construction Economics	Dr. John R. Riggleman
Mechanics Liens	Daniel H. Wheeler
XII. Specifications	Dr. Addams S. McAllister
Certification: Producer Contacts	Robert A. Martino
Labeling: Consumer Contacts	Dr. Addams S. McAllister
Directory of Specifications	Clarence W. Ingels
Encyclopedia of Specifications	George A. Wardlaw

XIII. TRADE STANDARDS	Ihler J. Fairchild
Wood Products, Paper, Rubber, etc.	Harry H. Steidle
Metal Products	Ihler J. Fairchild
Textiles and Garments	Ihler J. Fairchild
Ceramic Products and Cement	George W. Wray

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By May 1, 1940, dental research and field stations had become part of the NBS technical program.

MAY 1, 1940

DIRECTOR	Dr. Lyman J. Briggs
Assistant to the Director	Henry D. Hubbard
Assistant Director for Research and Testing	Dr. Eugene C. Crittendon
Assistant Director for Commercial Standardization	Dr. Addams S. McAllister
I. ELECTRICITY	Dr. Eugene C. Crittendon
Resistance Measurements	Dr. Frank Wenner
Inductance and Capacitance	Dr. Harvey L. Curtis
Electrical Instruments	Dr. Francis B. Silsbee
Magnetic Measurements	Raymond L. Sanford
Photometry	Dr. J. Franklin Meyer
Radio	Dr. J. Howard Dellinger
Underground Corrosion	Kirk H. Logan
Electrochemistry	Dr. George W. Vinal
Telephone Standards	Dr. Frank A. Wolff
II. WEIGHTS AND MEASURES	Henry W. Bearce
Length	Dr. Lewis V. Judson
Mass	Dr. Arthur T. Pienkowsky
Time	Ralph E. Gould
Capacity and Density	Elmer L. Peffer
Gas Measuring Instruments	Howard S. Bean
Thermal Expansion, Dental Research	Dr. Wilmer Souder
Weights and Measures Laws and Administration	Ralph W. Smith
Large-Capacity Scales	Ralph W. Smith
Gages	David R. Miller
III. HEAT AND POWER	Dr. Hobart C. Dickinson
Thermometry	Johanna Busse
Pyrometry	Dr. Henry T. Wensel
Heat Measurements	Eugene F. Mueller
Heat Transfer	Dr. Milton S. VanDusen
Cryogenic Laboratory	Dr. Ferdinand G. Brickwedde
Fire Resistance	Simon H. Ingberg
Automotive Power Plants	Herbert K. Cummings
Lubrication and Liquid Fuels	Dr. Oscar C. Bridgeman
Aviation Engines and Accessories	Melville F. Peters

IV. Optics	Dr. Clarence A. Skinner
Spectroscopy	Dr. William F. Meggers
Polarimetry	Frederick J. Bates
Colorimetry and Spectrophotometry	Dr. Kasson S. Gibson
Optical Instruments	Dr. Irvine C. Gardner
Radiometry	Dr. William W. Coblentz
Atomic Physics, Radium, X-Rays	Dr. Fred L. Mohler
Photographic Technology	Raymond Davis
Interferometry Chauncey	G. Peters
V. Chemistry	Dr. Gustave E.F. Lundell
Paints, Varnishes, etc.	Eugene F. Hickson
Detergents, Cement, etc.	Frederick W. Smither
Organic Chemistry	Campbell C. Waters
Metal and Ore Analysis, Standard Samples	Harry A. Bright
Reagents and Platinum Metals	Dr. Edward Wichers
Electrochemistry (Plating)	Dr. William Blum
Gas Chemistry	Elmer R. Weaver
Physical Chemistry	Dr. Edgar R. Smith
Thermochemistry and Constitution of Petroleum	Dr. Frederick D. Rossini
VI. Mechanics and Sound	Dr. Hugh L. Dryden
Engineering Instruments	Walter F. Stutz
Sound	Dr. Paul R. Heyl
Aeronautical Instruments	Dr. William G. Brombacher
Aerodynamic Physics	Dr. Hugh L. Dryden
Engineering Mechanics	Herbert L. Whittemore
Hydraulics	Herbert N. Eaton
VII. Organic and Fibrous Materials	Warren E. Emley
Rubber	Dr. Archibald T. McPherson
Textiles	William D. Appel
Paper	Bourdon W. Scribner
Leather	Roy C. Bowker
Testing and Specifications	Philip L. Wormeley
Fiber Structure	Dr. Solomon F. Acree
Organic Plastics	Dr. Gordon M. Kline
VIII. Metallurgy	Dr. Henry S. Rawdon
Optical Metallurgy	Dr. Henry S. Rawdon
Thermal Metallurgy	Dr. Dunlop J. McAdam, Jr.
Mechanical Metallurgy	William H. Swanger
Chemical Metallurgy	Dr. John G. Thompson
Experimental Foundry	Charles M. Saeger, Jr.

IX. Clay and Silicate Products	Phaon H. Bates
Whiteware	Roman F. Geller
Glass	Alfred N. Finn
Refractories	Raymond A. Heindl
Enameled Metals	William N. Harrison
Heavy Clay Products	Ray T. Stull
Cement and Concrete Materials	John Tucker, Jr.
Masonry Construction	Douglas E. Parsons
Lime and Gypsum	Dr. Lansing S. Wells
Stone	Daniel W. Kessler
X. Simplified Practice	Edwin W. Ely
Wood, Textiles, and Paper	George Schuster
Metal Products and Construction Materials	George Schuster
Containers and Miscellaneous Products	William E. Braithwaite
Materials Handling Equipment and Ceramics	Edwin W. Ely
XI. Trade Standards	Ihler J. Fairchild
Wood, Wood Products, etc.	James W. Medley
Metal Products	Ihler J. Fairchild
Textiles	Herbert A. Ehrman
Apparel	Lovic R. Gilbert
Petroleum, Chemicals, Rubber	Floyd W. Reynolds
Export Standards	Milton E. Countryman
XII. Codes and Specifications	Dr. Addams S. McAllister
Safety Codes	Dr. Morton G. Lloyd
Building Codes	George N. Thompson
Building Practice and Specifications	Vincent B. Phelan
Producer Contracts and Certification	George W. Wray
Consumer Contracts and Labeling	Robert A. Martino
Field Stations	
Allentown, Pa. (Cement and Concrete Materials)	William N. Moyer
Riverside, Calif. (Cement and Concrete Materials)	Donald N. Evans
San Francisco, Calif. (Cement and Concrete Materials)	I. Furlong
Denver, Colo. (Cement and Concrete Materials)	Orson H. Cox
Seattle, Wash. (Cement and Concrete Materials)	Elmer T. Carlson
Clearing, Ill. (Large-capacity Scale Testing)	C. L. Richard
San Jose, Calif. (Cement and Concrete Materials)	Bruce E. Foster
Beltsville, Md. (Radio Transmitting Station)	William D. George
Meadows, Md. (Radio Sending Station)	Samuel S. Kirby

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By March 1, 1950, the demands on NBS of World War II and the introduction of computers were evident in the Bureau structure.

MARCH 1, 1950

	DIRECTOR'S OFFICE	
	Director	Dr. Edward U. Condon
	Assistant to the Director	Hugh Odishaw
	Assistant to the Director	Nicholas E. Golovin
	Associate Director	Dr. Eugene C. Crittenden
	Associate Director	Dr. Wallace R. Brode
	OFFICE OF SCIENTIFIC PUBLICATIONS	Hugh Odishaw
.1	Library	Sarah Ann Jones
.2	Technical Reports	W. Reeves Tilley
.3	Publications	Jesse L. Mathusa
	OFFICE OF WEIGHTS AND MEASURES	Ralph W. Smith
	Assistant Chief	William S. Bussey
1	**ELECTRICITY AND OPTICS**	Dr. Francis B. Silsbee
	Assistant Chief	Dr. Kasson S. Gibson
.1	Resistance Measurements	Dr. James L. Thomas
.2	Inductance and Capacitance	Dr. Charles Moon
.3	Electrical Instruments	Dr. Francis M. Defandorf
.4	Magnetic Measurements	Raymond L. Sanford
.5	Photometry and Colorimetry	Dr. Kasson S. Gibson
.6	Optical Instruments	Dr. Irvine C. Gardner
.7	Photographic Technology	Raymond Davis
.8	Electrochemistry	Dr. George W. Vinal
2	**METROLOGY**	Dr. Wilmer Souder
	Assistant Chief	David R. Miller
.1	Length	Dr. Lewis V. Judson
.2	Mass	Lloyd B. Macurdy
.3	Time	Horace A. Bowman (Acting)
.4	Capacity, Density and Fluid Meters	Howard S. Bean
.6	Thermal Expansion	Dr. Peter Hidnert
.7	Dental Materials	Dr. Irl C. Schoonover
.8	Scales	H. Haig Russell
.9	Gages	David R. Miller
3	**HEAT AND POWER**	Dr. Ferdinand G. Brickwedde
.1	Temperature Measurements	Dr. Raymond E. Wilson
.2	Thermodynamics	Dr. Ferdinand G. Brickwedde
.3	Cryogenics	Russell B. Scott
.4	Engines and Lubrication	Samuel A. McKee
.5	Engine Fuels	Dr. Frank L. Howard (Acting)
.6	Combustion	Dr. Ernest F. Fiock

4	ATOMIC AND RADIATION PHYSICS	Dr. Robert D. Huntoon
	Assistant Chief	Lauriston S. Taylor
	Radioactivity Consultant	Dr. Leon F. Curtiss
	Stable Tracers Consultant	Dr. Fred L. Mohler
4A	**Atomic Physics Laboratory**	Dr. Robert D. Huntoon
.1	Spectroscopy	Dr. William F. Meggers
.2	Radiometry	Dr. Curtis J. Humphreys
.3	Mass Spectrometry	Dr. Fred L. Mohler
.4	Physical Electronics	Dr. Willard H. Bennett
.5	Electron Physics	Dr. Ladislaus L. Marton
.6	Atomic Physics	Dr. John A. Hipple
.7	Neutron Measurements	Dr. Leon F. Curtiss
4R	**Radiation Physics Laboratory**	Lauriston S. Taylor
.8	Nuclear Physics	Dr. Ugo Fano
.9	Radioactivity	Lauriston S. Taylor (Acting)
.10	X-Rays	Harold O. Wyckoff
.11	Betatron	Herman W. Koch
.12	Nucleonic Instrumentation	Harold O. Wyckoff (Acting)
.13	Radiological Equipment	Dr. Scott W. Smith
5	CHEMISTRY	Dr. Edward W. Wichers
	Assistant Chief	Dr. William Blum
.1	Paint, Varnish and Lacquer	Eugene F. Hickson
.2	Surface Chemistry	Dr. James I. Hoffman
.3	Organic Chemistry	W. Harold Smith
.4	Analytical Chemistry	Harry A. Bright
.5	Platinum Metals and Pure Substances	Dr. Raleigh Gilchrist
.6	Electrodeposition	Dr. William Blum
.7	Gas Chemistry	Elmer R. Weaver
.8	Physical Chemistry	Dr. Edgar R. Smith
.9	Thermochemistry and Hydrocarbons	Dr. Frederick D. Rossini
.10	Spectrochemistry	Bourdon F. Scribner
6	MECHANICS	Dr. Walter Ramberg
.1	Sound	Dr. Richard K. Cook
.2	Mechanical Instruments	Dr. William G. Brombacher
.3	Aerodynamics	Dr. Galen B. Schubauer
.4	Engineering Mechanics	Bruce L. Wilson
.5	Hydraulics	Herbert N. Eaton
7	ORGANIC AND FIBROUS MATERIALS	Dr. Archibald T. McPherson
	Assistant Chief	Dr. Gordon M. Kline
	Consultant	Dr. Robert Simha
.1	Rubber	Dr. Lawrence A. Wood
.2	Textiles	William D. Appel
.3	Paper	Bourdon W. Scribner
.4	Leather	Everett L. Wallace
.5	Testing and Specifications	Dr. Robert D. Stiehler
.7	Organic Plastics	Dr. Gordon M. Kline
8	METALLURGY	Dr. John G. Thompson
	Assistant Chief	William F. Roeser
.1	Optical Metallurgy	George A. Ellinger
.2	Thermal Metallurgy	Thomas G. Digges

	.3	Mechanical Metallurgy	William F. Roeser
	.4	Chemical Metallurgy	Harold E. Cleaves
	.5	Experimental Foundry	Alexander I. Krynitsky
	.6	Underground Corrosion	Dr. Irving A. Denison
9		MINERAL PRODUCTS	Dr. Herbert Insley
	.1	Porcelain and Pottery	Roman F. Geller
	.2	Glass	Clarence H. Hahner
	.3	Refractories	Raymond A. Heindl
	.4	Enameled Metals	William N. Harrison
	.5	Building Stone	Daniel W. Kessler
	.6	Concreting Materials	Raymond L. Blaine
	.7	Constitution and Microstructure	Howard F. McMurdie
	.8	Chemistry of Mineral Products	Dr. Lansing S. Wells
10		BUILDING TECHNOLOGY	Douglas E. Parsons
		Assistant Chief	George N. Thompson
	.1	Structural Engineering	Douglas E. Parsons
	.2	Fire Protection	Nolan D. Mitchell
	.3	Heating and Air Conditioning	Richard S. Dill
	.4	Exterior and Interior Covering	Hubert R. Snoke
	.5	Codes and Specifications	George N. Thompson
11		APPLIED MATHEMATICS	Dr. John H. Curtiss
		Assistant Chief	Dr. Edward W. Cannon
	.1	Numerical Analysis	Dr. J. Berkley Rosser (UCLA)
	.2	Computation	Dr. Franz L. Alt (Acting)
	.3	Statistical Engineering	Dr. Churchill Eisenhart
	.4	Machine Development	Dr. Edward W. Cannon (Acting)
12		COMMODITY STANDARDS	Edwin W. Ely
		Assistant Chief	Floyd W. Reynolds
	.1	Metal and Ceramic Products	George Schuster
	.2	Textiles and Apparel	Herbert A. Ehrman
	.3	Mechanical Equipment	James W. Medley
	.4	Packaging	William E. Braithwaite
	.5	Chemical Products	Floyd W. Reynolds
13		ELECTRONICS AND ORDNANCE	Dr. Allen V. Astin
		Assistant Chief for Ordnance	Wilbur S. Hinman, Jr.
		Assistant Chief for Aerophysics	Dr. Harold K. Skramstad
		Electronics Consultant	Dr. Robert D. Huntoon
		Electronics Consultant	Dr. Chester H. Page
		Technical Aide	Robert S. Walleigh
		Electronic Standards Laboratory	(Vacant)
	.1	Engineering Electronics	Joseph G. Reid, Jr.
	.2	Electron Tubes	Dr. John E. White
	.3	Electronic Computers	Dr. Samuel N. Alexander
		Ordnance Development Laboratory	Wilbur S. Hinman, Jr.
	.4	Ordnance Research	Dr. Harold Goldberg
	.5	Ordnance Mechanics	Jacob Rabinow
	.6	Ordnance Electronics	P. Anthony Guarino
	.7	Ordnance Engineering	Myron G. Domsitz
	.8	Ordnance Tests	Theodore B. Godfrey

	Guided Missile Branch	Ralph A. Lamm
.9	Missile Dynamics	Dr. Harold K. Skramstad
.10	Missile Intelligence	Dr. Fred S. Atchison
.11	Missile Engineering	Ralph A. Lamm
.12	Missile Instrumentation	William A. Wildhack
.13	Technical Services	James D. McLean (Acting)
14	CENTRAL RADIO PROPAGATION LABORATORY	Dr. Newbern Smith
	Assistant Chief	Alvin G. McNish
	Assistant Chief	Kenneth A. Norton
	Microwave Research Consultant	Dr. Thomas J. Carroll, Jr.
	Ionospheric Research Laboratory	
.1	Upper Atmosphere Research	Alvin G. McNish
.5	Ionospheric Research	Ross Bateman
.7	Field Operations	Henry P. Hutchinson
	Systems Research Laboratory	
.3	Regular Propagation Services	Walter B. Chadwick
.4	Frequency Utilization Research	Kenneth A. Norton
.6	Tropospheric Propagation Research	Jack W. Herbstreit (Acting)
	Measurement Standards Laboratory	
.8	High Frequency Standards	William D. George
.9	Microwave Standards	Dr. Harold Lyons
M	BUDGET AND MANAGEMENT	Herbert E. Weifenbach
.1	Budget	Edward E. Upperman
.2	Management Planning	Wilbur W. Bolton, Jr.
.3	Procurement	Charles B. Kipps
.4	Property Management	George B. Kefover
.5	Records and Communications	Robert W. Lamberson
.6	Accounting	Clinton G. Hall
.7	Special Services	Frank D. Moncure (Acting)
P	PERSONNEL	Raymond L. Randall
	Assistant Chief	William C. Fewell
.1	Recruitment and Placement	Raymond L. Randall
.2	Operations	Jessie B. Berkley
.3	Classification	Lawrence L. Epperson
.4	Medical Office	Dr. William Frank
.5	Education and Training	Joseph Hilsenrath
E	PLANT	William J. Ellenberger
	Assistant Chief	Oscar L. Britt
.1	Power Plant	Grover F. Hamby
.2	Electrical Shop	George V. Hall
.3	Piping Shop	Raymond A. Watson
.4	Carpenter Shop	Paul J. Robinson
.5	Paint Shop	Raymond E. Mothershead
.6	General Service	Frank A. Peters
.7	Garage	Harry C. Magruder
.8	Guard	Herman B. Burke
.9	Grounds	William R. David
.10	Janitorial	Adeeb J. Neam
.11	Refrigeration and Air Conditioning	Elridge G. Burke
.12	Administrative and Engineering Office	(Vacant)

S	**SHOPS**	Paul S. Ballif
	Assistant Chief	Winfield L. Drissel
	Shop Superintendent	John L. Hutton
	.1 Design and Drafting	Richard J. Hanrahan
	.2 Instrument Shop No. 1	Henry N. Philo
	.3 Instrument Shop No. 2	George A. Rheinbold
	.4 Instrument Shop No. 3	George W. Bicking, Jr.
	.5 Instrument Shop No. 4	Charles W. Hyder
	.6 Instrument Shop No. 5	Andrew J. Altman
	.7 Welding and Sheet Metal Shop	Edward G. Clark
	.8 Woodworking Shop	Paul D. Huntley
	.9 Shop Tools	Lewis H. Brigham
	.10 Maintenance	Winfield L. Drissel
	.11 Glassblowing Shop	Leonardo Testa
	.12 Metals Storeroom	James E. Mallory

FIELD STATIONS

1 **ELECTRICITY AND OPTICS**

Lamp Inspector, Brookline, MA
George Schnitzler

2 **METROLOGY**

Master Scale Depot, Clearing, IL
H. Haig Russell, Chief

9 **MINERAL PRODUCTS**

Cement Testing and Inspection Station, Allentown, PA
William N. Moyer, Chief

Cement Testing and Inspection Station, Riverside Cement Co., Riverside, CA
Donald N. Evans, Chief

Cement Testing and Inspection Station, Permanente Cement Co., Permanente, CA
Martin Defore, Chief

Cement Testing and Inspection Station, Sanitary Engineering Building, University of Washington, Seattle, WA
Frank N. Winblade, Chief

Cement and Concrete Materials Testing Station, Denver, CO
Orson H. Cox, Chief

Materials Testing Station, San Francisco, CA
Otto C. Marek (Acting) Chief

11 **APPLIED MATHEMATICS**

Institute for Numerical Analysis, University of California at Los Angeles, Los Angeles, CA
Dr. J. Berkley Rosser (Acting) Chief

13 **ELECTRONICS**

Blossom Point Proving Ground, La Plata, MD
Adrian P. Sutton, Chief

Warren Grove Test Field, Warren Grove, Tuckerton, NJ
William A. Wildhack, Chief

14 CENTRAL RADIO PROPAGATION LABORATORY

Radio Propagation Field Station, Anchorage, AK
Vernon H. Goerke, Chief

Radio Propagation Field Station, Point Barrow, AK
Lloyd A. Lohr, Chief

Radio Propagation Field Station, Island of Guam
Herschel C. Carmichael, Chief

Radio Propagation Field Station, Puunene, Maui, Territory of Hawaii
Leo W. Honea, Chief

Radio Propagation Field Station, Palmyra Island, Honolulu, Territory of Hawaii
Stephen S. Barnes, Chief (Acting)

Radio Propagation Field Station, Ramey Air Force Base, Puerto Rico
Theodore R. Gilliland, Chief

Radio Propagation Field Station, Trinidad, B. W. I.
Richard F. Carle, Chief

Radio Propagation Field Station, White Sands Proving Ground, Las Cruces, NM
Earl E. Ferguson, Chief

Radio Propagation Field Station, Ft. Belvoir, VA
Edward J. Wiewara, Chief

Radio Propagation Laboratory, Sterling, VA
Victor C. Pineo, Chief

Radio Transmitting Station, Beltsville, MD
Gordon H. Lester, Chief

The divestiture of the World War II military research groups—electronic standards laboratory, ordnance development laboratory, and guided missile branch—had been accomplished by October 1, 1954, under Director Allen Astin. By then, too, new laboratories had been created in Boulder, Colorado.

OCTOBER 1, 1954

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	Associate Director for Physics	Dr. Robert D. Huntoon
	Associate Director for Testing	Dr. Archibald T. McPherson
	Associate Director for Administration	Nicholas E. Golovin
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	Consultant to the Director	Dr. Leon F. Curtiss
	Consultant to the Director	Dr. Chester H. Page
	Consultant to the Director	Dr. Wilmer Souder
	Consultant to the Director	Alvin G. McNish
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	Program Records Officer	Clarence N. Coates
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.3	Publications	Jesse L. Mathusa
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.2	Electron Tubes	Charles P. Marsden, Jr.
.3	Electrical Instruments	Dr. Francis M. Defandorf
.4	Magnetic Measurements	Irvin L. Cooter (Acting)
.5	Process Technology	Lucien P. Tuckerman
.6	Engineering Electronics	Dr. Paul J. Selgin
.7	Electronic Instrumentation	Carroll Stansbury
.8	Electrochemistry	Dr. Walter J. Hamer
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	Assistant Chief	Dr. Kasson S. Gibson
	Assistant to the Chief	Leroy W. Tilton
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.2	Optical Instruments	Dr. Francis E. Washer
.3	Photographic Technology	Raymond Davis
.4	Length	Dr. Lewis V. Judson
.5	Engineering Metrology	Irvin H. Fullmer

3	**HEAT AND POWER**	Dr. Ferdinand G. Brickwedde
.1	Temperature Measurements	Dr. Ferdinand G. Brickwedde (Acting)
.2	Thermodynamics	Dr. Charles W. Beckett
.3	Cryogenics	Dr. Ralph P. Hudson (Acting)
.4	Engines and Lubrication	James F. Swindells (Acting)
.5	Engine Fuels	Dr. Frank L. Howard
4	**ATOMIC AND RADIATION PHYSICS**	Dr. Lauriston S. Taylor
4A	**Atomic Physics Laboratory**	
.1	Spectroscopy	Dr. William F. Meggers
.2	Radiometry	Dr. Earle K. Plyler
.3	Mass Spectrometry	Dr. Fred L. Mohler
.4	Solid State Physics	Dr. Robert G. Breckenridge
.5	Electron Physics	Dr. Ladislaus L. Marton
.6	Atomic Physics	Dr. Lewis M. Branscomb (Acting)
4R	**Radiation Physics Laboratory**	Dr. Harold O. Wyckoff
.8	Nuclear Physics	Dr. Ugo Fano
.9	Radioactivity	Dr. Wilfrid B. Mann
.10	X-Rays	Dr. Harold O. Wyckoff
.11	Betatron	Dr. Herman W. Koch
.12	Nucleonic Instrumentation	Louis Costrell
.13	Radiological Equipment	Dr. Scott W. Smith
.14	Radiation Instruments Branch, Atomic Energy Commission	Robert L. Butenhoff
5	**CHEMISTRY**	Dr. Edward Wichers
	Assistant Chief	Dr. James I. Hoffman
.1	Organic Coatings	Paul T. Howard
.2	Surface Chemistry	Dr. James I. Hoffman
.3	Organic Chemistry	W. Harold Smith
.4	Analytical Chemistry	Harry A. Bright
.5	Inorganic Chemistry	Dr. Raleigh Gilchrist
.6	Electrodeposition	Dr. Abner Brenner
.7	Gas Chemistry	Elmer R. Weaver
.8	Physical Chemistry	Dr. Edgar R. Smith
.9	Thermochemistry	Edward J. Prosen
.10	Spectrochemistry	Bourdon F. Scribner
.11	Pure Substances	Dr. Charles P. Saylor
6	**MECHANICS**	Dr. Walter Ramberg
	Consultant	Dr. Wilmer Souder
.1	Sound	Dr. Richard K. Cook
.2	Mechanical Instruments	Edward C. Lloyd
.3	Fluid Mechanics	Dr. Galen B. Schubauer
.4	Engineering Mechanics	Bruce L. Wilson
.6	Mass and Scale	Douglas R. Tate
.7	Capacity, Density and Fluid Meters	Howard S. Bean
.8	Combustion Controls	Dr. Ernest F. Fiock

7	**ORGANIC AND FIBROUS MATERIALS**	Dr. Gordon M. Kline
	Assistant Chief	William D. Appel
	.1 Rubber	Dr. Lawrence A. Wood
	.2 Textiles	William D. Appel
	.3 Paper	Dr. Robert B. Hobbs
	.4 Leather	Everett L. Wallace
	.5 Testing and Specifications	Dr. Robert D. Stiehler
	.6 Polymer Structure	Dr. Norman P. Bekkedahl
	.7 Organic Plastics	Frank W. Reinhart
	.8 Dental Research	William T. Sweeney
8	**METALLURGY**	Dr. John G. Thompson
	.1 Thermal Metallurgy	Thomas G. Digges
	.2 Chemical Metallurgy	Leroy L. Wyman
	.3 Mechanical Metallurgy	John A. Bennett
	.4 Corrosion	George A. Ellinger
9	**MINERAL PRODUCTS**	Dr. Irl C. Schoonover
	Assistant Chief	Clarence H. Hahner
	.1 Porcelain and Pottery	Roman F. Geller
	.2 Glass	Clarence H. Hahner
	.3 Refractories	Raymond A. Heindl
	.4 Enameled Metals	William N. Harrison
	.6 Concreting Materials	Raymond L. Blaine
	.7 Constitution and Microstructure	Howard F. McMurdie
10	**BUILDING TECHNOLOGY**	Douglas E. Parsons
	Assistant Chief	George N. Thompson
	Consultant	William F. Roeser
	Consultant	John W. McBurney
	.1 Structural Engineering	Douglas E. Parsons
	.2 Fire Protection	Dr. Alexander F. Robertson
	.3 Heating and Air Conditioning	Richard S. Dill
	.4 Floor, Roof and Wall Coverings	Dr. Hubert R. Snoke
	.5 Codes and Specifications	George N. Thompson
11	**APPLIED MATHEMATICS**	Dr. Franz L. Alt (Acting)
	Assistant Chief	Dr. Edward W. Cannon
	.1 Numerical Analysis	John Todd
	.2 Computation	Dr. Milton Abramowithz (Acting)
	.3 Statistical Engineering	Dr. Churchill Eisenhart
	.4 Machine Development	Dr. Edward W. Cannon
12	**DATA PROCESSING SYSTEMS**	Samuel N. Alexander
	Assistant Chief for Systems	Dr. Harold K. Skramstad
	.1 Components and Techniques	Arthur W. Holt
	.2 Digital Circuitry	Robert D. Elbourn
	.3 Digital Systems	Alan L. Leiner
	.4 Analog Systems	Dr. Harold K. Skramstad (Acting)

40	**ACCOUNTING**	Gordon D. Horsburgh
	Deputy Chief	Willard K. Duckworth
.1	Accounts and Reports	Margaret L. Spiess
.2	Classification	Pearl E. Miller
.3	Tabulation	John P. Lafon
.4	Voucher Examination	Matilda Udoff
.5	Billing and Collection	Doris J. Lothrop
.6	Payroll	Kathryn L. Rock
41	**PERSONNEL**	George R. Porter
	Assistant Chief	Frankie R. Keyser
.1	Board of Civil Service Examiners	Edith N. Fimple
.2	Recruitment and Placement	Frankie R. Keyser
.3	Classification	Charles V. Ramey
.4	Employee Relations	Ruth B. Armsby
.5	Operations and Procedures	Helen V. Courtney
.6	Medical Office	Dr. Charles P. Waite
42	**ADMINISTRATIVE SERVICES**	Harry P. Dalzell
	Assistant Chief	Karl L. Hafen
	Assistant for Safety and Civil Defense	Leo W. Scott
.1	Records and Communications	Joseph L. Shulman (Acting)
.2	Special Services	Gird M. Tolley, Jr. (Acting)
.3	Janitorial Services	Robert C. Howey
.4	Guard Services	Capt. William R. Allen
.5	Transportation Services, Garage	Charles W. Anderson
.6	Security Officer	Harry P. Dalzell
.7	Test Administration	Randolph K. Artz
43	**SHOPS**	Frank P. Brown
	Assistant Chief	Winfield L. Drissel
.1	Instrument Shop No. 1	David G. Kennedy
.2	Instrument Shop No. 2	George A. Rheinbold
.3	Instrument Shop No. 3	George A. Rheinbold
.4	Instrument Shop No. 4	Norman C. Pines
.5	Instrument Shop No. 5	Robert E. Ward
.6	Instrument Shop No. 6	Andrew J. Altman
.7	Welding and Sheet Metal Shop	Terrell C. Freemon
.9	Tool Crib	Lewis H. Brigham
.10	Maintenance	Winfield L. Drissel
.11	Glassblowing Shop	Leonardo Testa
44	**SUPPLY**	George B. Kefover
.3	Procurement	Charles B. Kipps
.4	Property Management	Harold G. Nicholas (Acting)
45	**MANAGEMENT PLANNING STAFF**	Ivan Asay
46	**BUDGET STAFF**	Wilbur W. Bolton, Jr.
	Deputy Budget Officer	William E. Lilly
47	**INTERNAL AUDIT**	Paul McClenon

50	**PLANT**	Charles A. Dieman
	Assistant Chief	Clarence B. Crane
.1	Power Plant	Arthur C. Ramm
.2	Electric Shop	George V. Hall
.3	Piping Shop	Raymond A. Watson
.4	Construction Shop	John A. King
.5	Paint Shop	Howell C. Walker
.6	Labor Services	Roy B. Powell
.7	Metal Shop	Charles Needham
.8	Special Laboratory Service	Donald J. Leweck (Acting)
.9	Grounds	William R. Stevenson (Acting)
.11	Refrigeration and Air Conditioning	James S. Powers
Boulder Laboratories*		
	Director	Dr. Frederick W. Brown
	Administration	S.W.J. Welch
.1	Washington Liaison Office	Roswell C. Peavey
.3	Personnel	Roy W. Stockwell, Jr.
.4	General Services	Barton F. Betts
.5	Engineering Services	Paul S. Ballif
81	**Cryogenic Engineering***	Russell B. Scott
.1	Cryogenic Equipment	Bascom W. Birmingham (Acting)
.2	Cryogenic Processes	Peter C. Vander Arend (Acting)
.3	Properties of Materials	Martin M. Reynolds (Acting)
.4	Gas Liquefaction	Victor J. Johnson (Acting)
82	**Radio Propagation Physics***	Dr. Ralph J. Slutz
.1	Upper Atmosphere Research	Thomas N. Gautier, Jr.
.2	Ionospheric Research	Ross Bateman
.3	Regular Propagation Services	Walter B. Chadwick
83	**Radio Propagation Engineering***	Kenneth A. Norton
.4	Frequency Utilization Research	Kenneth A. Norton (Acting)
.6	Tropospheric Propagation Research	Jack W. Herbstreit
84	**Radio Standards***	H. A. Thomas
	Assistant Chief for Research	Dr. Harold Lyons
84A	High Frequency Standards Branch	William D. George
.1	High Frequency Electrical Standards	Myron C. Selby
.2	Radio Broadcast Service	A. H. Moran (Acting)
.3	HF Impedance Standard	(Vacant)
84B	Microwave Standards Branch	Dr. Harold Lyons
.6	Extreme High-Frequency and Noise	Dr. David M. Kerns (Acting)
.7	Microwave Frequency and Spectroscopy	George Birnbaum
.8	Microwave Circuit Standard	Robert W. Beatty (Acting)

* Laboratories located in Boulder, Colorado.

FIELD STATIONS

2 OPTICS AND METROLOGY

Lamp Inspector, Brookline, MA

Visual Landing Aids Field Laboratory, Arcata Airport, Arcata, Humboldt County, CA

6 MECHANICS

NBS Master Railway Track Scale Depot, Clearing, IL

9 MINERAL PRODUCTS

9.6 Concreting Materials

Allentown, PA
Denver, CO
Kansas City, MO
San Francisco, CA
Seattle, WA

80 CENTRAL RADIO PROPAGATION LABORATORY

Radio Propagation Field Station, Anchorage, AK
Radio Propagation Field Station, Point Barrow, AK
Radio Propagation Field Station, Bluie West-1, Greenland
Radio Propagation Field Station, Guam Island
Radio Propagation Field Station, Puunene, Maui, Territory of Hawaii
Radio Propagation Field Station, Ramey Air Force Base, Puerto Rico
Radio Propagation Field Station, Fort Gulick, Panama Canal Zone
Radio Propagation Field Station, Ft. Belvoir, VA
Cheyenne Mountain Field Station, Colorado Springs, CO
Radio Propagation Laboratory, Sterling, VA
Radio Transmitting Station, Beltsville, MD
Radio Noise Recording Station, Front Royal, VA

During 1964, Director Allen V. Astin created a new management structure based upon Institutes for basic standards, for materials research, and for applied technology.

July 1, 1964

100	**OFFICE OF THE DIRECTOR**	
	Director	Dr. Allen V. Astin
	Deputy Director	Dr. Irl C. Schoonover
	Assistant to the Director	George E. Auman
	Assistant to the Director	Clarence N. Coates
	Assistant to the Director, Automatic Data Processing	W. Howard Gammon
	Senior Research Fellow	Dr. Churchill Eisenhart
	Senior Research Fellow	Dr. Ugo Fano
	Senior Research Fellow	Dr. James R. Wait
102	**OFFICE OF PUBLIC INFORMATION**	A. Victor Gentilini
103	**TECHNICAL ANALYSIS GROUP**	(Vacant)
104	**OFFICE OF PROGRAM PLANNING AND EVALUATION**	
	Associate Director for Resources Planning	Dr. Shirleigh Silverman
120	**ASSOCIATE DIRECTOR FOR ADMINISTRATION**	
	Associate Director	Robert S. Walleigh
	Patent Advisor	David Robbins
121	**ACCOUNTING**	Jacob Seidenberg
	Deputy Chief	Homer McIntyre
.01	Reports and Billing	Pearl E. Miller
.02	Classification	Edgar H. MacArthur
.03	Tabulation	Frederick I. Baum (Acting)
.04	Voucher Examination	Matilda Udoff
.05	Payroll	Kathryn L. Rock
122	**ADMINISTRATIVE SERVICES**	Harry P. Dalzell
	Assistant Chief	Karl L. Hafen
.01	Records and Communications	Howard L. Sampson
.02	Special Services	Walter J. Rabbitt
.03	Janitorial Services	Robert C. Howey
.04	Guard Services	Capt. William J. Kane
.05	Transportation Services	Charles W. Anderson
.06	Security Office	Harry P. Dalzell
123	**BUDGET AND MANAGEMENT**	Dr. James E. Skillington, Jr.
.01	Budget	Eugene C. Denne
.02	Management Analysis	John B. Tallerico
124	**INTERNAL AUDIT**	Harold F. Whittington

125	**PERSONNEL**		George R. Porter
	Assistant Chief		Henry C. Bothe
	.01	Board of Civil Service Examiners	Warren J. Barker
	.02	Recruitment and Placement	Henry C. Bothe
	.03	Salary and Wage Administration	Charles V. Ramey
	.04	Employee Relations and Training	Ruth B. Armsby
	.05	Operations and Procedures	Edith C. Lewis
	.06	Medical Office	Dr. A. S. Cross
126	**PLANT**		M. Bernard Goetz (Acting)
	Assistant Chief		M. Bernard Goetz
	.01	Steam-Chilled Water Generation	James S. Powers
	.02	Electric Shop	Robert W. Miller
	.03	Piping	Gerard John Finan
	.04	Construction Shop	John A. King
	.05	Gaithersburg Plant Services	Berkley E. Wigglesworth
	.06	Labor Services	Roy B. Powell
	.07	Metal Shop	Donald I. Thompson
	.08	Air Conditioning and Refrigeration	Dominick M. Giampietro
	.09	Grounds	William R. Stevenson
127	**SUPPLY**		George B. Kefover
	Deputy Chief		Arthur L. Longwell
	.01	Storeroom	Walter C. Bonner (Acting)
	.02	General Services	Fred H. Johncox (Acting)
	.03	Procurement	Charles B. Kipps
	.04	Property Management	Harold G. Nicholas

140 ASSOCIATE DIRECTOR FOR TECHNICAL SUPPORT

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International Relations		Ladislaus L. Marton
141	**TECHNICAL PUBLICATIONS**	W. Reeves Tilley
Assistant Chief		William K. Gautier
.01	Information	Robert T. Cook (Acting)
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.03	Publications	John E. Carpenter
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.05	Graphic Arts	Conrad F. Peters
142	**RESEARCH INFORMATION**	Dr. Lauriston S. Taylor (Acting)
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143	**RADIATION SAFETY**	Dr. Lauriston S. Taylor (Acting)
.01	Health Physics	Dr. Abraham Schwebel
144	**PROFESSIONAL DEVELOPMENT**	Vacant

154	**INSTRUMENT SHOPS**	Frank P. Brown
	Assistant Chief	Winfield L. Drissel
.01	Instrument Shop #1	John R. Hettenhouser
.02	Instrument Shop #2	Walter A. Koepper
.03	Instrument Shop #3	Charles E. Taylor
.04	Instrument Shop #4	Philip Pfaff, Jr.
.05	Instrument Shop #5	Philip Pfaff, Jr.
.06	Glassblowing	Enrico Deleonibus
.07	Welding and Sheet Metal Shop	Harold E. Brown
.08	Optical Shop	Stanley W. Gerner
.09	Tool Crib	Lewis H. Brigham

*160 MANAGER, BOULDER LABORATORIES

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Consultant–Math Group and Computation Facility	Dr. John J. Sopka
Consultant–Mathematical Physics	H. E. Brown

*161	**ADMINISTRATIVE, BOULDER LABORATORIES**	Samuel W. J. Welch
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.10	Management Planning	J. Berkley
.20	Personnel	Roy W. Stockwell
.30	Fiscal	Herbert D. Stansell
.40	Supply	Barton F. Betts
.50	Office Services	Richard G. Bulgin
.60	Plant Engineering	Edgar A. Yuzwiak
.70	Shops	John L. Hutton

200 INSTITUTE FOR BASIC STANDARDS

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Associate Director, Measurement Services	William A. Wildhack

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	Chemical Kinetics	Dr. Stephen A. Rossmassler
	Information Systems	Dr. Franz L. Alt

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	Consultant	Ida Rhodes
	Consultant	Dr. William J. Youden
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.02	Computation	Dr. Don I. Mittleman
.03	Statistical Engineering	Joseph M. Cameron
.04	Mathematical Physics	Dr. William H. Pell
.05	Operations Research	Dr. Alan J. Goldman

211	**ELECTRICITY**	Dr. Chester H. Page
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.02	Electrochemistry	Dr. Walter J. Hamer
.03	Electrical Instruments	Francis L. Hermach
.04	Magnetic Measurements	Irvin L. Cooter
.05	Dielectrics	Dr. Arnold H. Scott
.06	High Voltage	Dr. F. Ralph Kotter
.07	Absolute Electrical Measurements	Dr. Forest K. Harris
212	**METROLOGY**	Alvin G. McNish
	Assistant Chief	Dr. Deane B. Judd
.11	Photometry and Colorimetry	Louis E. Barbrow
.12	Refractometry	Dr. Francis E. Washer
.13	Photographic Research	Calvin S. McCamy
.21	Length	Theodore R. Young
.22	Engineering Metrology	Irvin H. Fullmer
.31	Mass and Volume	Paul E. Pontius
213	**MECHANICS**	Bruce L. Wilson
	Consultant	Dr. John M. Frankland
	Consultant	Edward C. Lloyd
.01	Sound	Dr. Richard K. Cook
.02	Pressure and Vacuum	Dr. Daniel P. Johnson
.03	Fluid Mechanics	Dr. Galen B. Schubauer
.04	Engineering Mechanics	Lafayette K. Irwin
.05	Rheology	Dr. Robert S. Marvin
.06	Combustion Controls	Frank R. Caldwell
221	**HEAT**	Dr. Ralph P. Hudson
	Assistant Chief, Thermodynamics	Dr. Charles W. Beckett
.01	Temperature Physics	James F. Swindells
.02	Heat Measurements	Dr. Defoe C. Ginnings
.03	Cryogenic Physics	Dr. Ernest Ambler
.04	Equation of State	Joseph Hilsenrath
.05	Statistical Physics	Dr. Melville S. Green
222	**ATOMIC PHYSICS**	Dr. Karl G. Kessler
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.02	Infrared and Microwave Spectroscopy	Dr. David R. Lide, Jr.
.03	Far Ultraviolet Physics	Dr. Robert P. Madden
.04	Solid State Physics	Dr. Hans P. R. Frederikse
.05	Electron Physics	Dr. John A. Simpson
.06	Atomic Physics	Dr. Harold S. Boyne
.07	Plasma Spectroscopy	Dr. Wolfgang L. Wiese
223	**PHYSICAL CHEMISTRY**	Dr. Merrill B. Wallenstein
	Consultant	Dr. William L. Clinton
	Consultant	Edward J. Prosen
.01	Chemical Kinetics Information Center	Dr. Ransom B. Parlin
.02	Theoretical Chemistry	Dr. Morris Krauss
.11	Thermochemistry	Donald D. Wagman
.21	Surface Chemistry	Dr. Ralph Klein
.31	Organic Chemistry	Dr. Horace S. Isbell
.41	Molecular Spectroscopy	Dr. David E. Mann
.51	Elementary Processes	Dr. Robert E. Ferguson
.52	Mass Spectrometry	Dr. Harry M. Rosenstock
.53	Photo Chemistry and Radiation Chemistry	Dr. James R. McNesby

*224	LABORATORY ASTROPHYSICS	Dr. Lewis M. Branscomb
231	RADIATION PHYSICS	Dr. Herman W. Koch
.01	Radiation Theory	Dr. Haakon A. Olsen
	RADIOLOGICAL PHYSICS BRANCH	Dr. J. W. Motz
.11	X-ray Physics	Dr. J. W. Motz
.12	Dosimetry	Dr. Scott W. Smith
.13	X-ray Standards	Dr. Harold O. Wyckoff
	NUCLEAR PHYSICS BRANCH	Dr. Herman W. Koch
.21	Radioactivity	Dr. Wilfrid B. Mann
.22	Neutron Physics	Dr. Randall S. Caswell
.23	Photonuclear Physics	Dr. Everett G. Fuller
.24	Nuclear Spectroscopy	Dr. Raymond W. Hayward
	Accelerator Branch	Dr. James E. Leiss
.31	Accelerator Engineering	Dr. James E. Leiss
.32	Radiation Physics Instrumentation	Louis Costrell
.33	Accelerator Physics	Dr. James E. Leiss
*250	RADIO STANDARDS LABORATORY	Dr. John M. Richardson
	Scientific Consultant	Dr. David M. Kerns
*251	RADIO STANDARDS PHYSICS	Dr. L. Yardley Beers
	Assistant Chief	Dr. George E. Hudson
	Consultant	Dr. Paul F. Wacker
.01	Frequency-Time Dissemination Research	Alvin H. Morgan
.02	Frequency-Time Broadcast Services	David H. Andrews
.03	Radio and Microwave Materials	John L. Dalke
.04	Atomic Frequency and Time Interval Standards	Dr. Richard C. Mockler
.06	Radio Plasma	Dr. Karl B. Persson
.07	Microwave Physics	Dr. Robert W. Zimmerer (Acting)
*252	RADIO STANDARDS ENGINEERING	Dr. George E. Schafer
	Consultant	Robert W. Beatty
	Consultant	Myron C. Selby
.11	Low Frequency Calibration Services	Frank D. Weaver (Acting)
.21	HF Calibration Services	Dr. K. R. Wendt
.22	HF Electrical Standards	Charles M. Allred
.23	HF Impedance Standards	Robert C. Powell
.31	Microwave Calibration Services	Roy E. Larson
.32	Microwave Circuit Standards	Dr. Maurice B. Hall
300	INSTITUTE FOR MATERIALS RESEARCH	
	Director	Dr. Irl C. Schoonover (Acting)
	Deputy Director	Dr. Harry C. Allen Jr. (Acting)
302	OFFICE OF STANDARD REFERENCE MATERIALS	Dr. W. Wayne Meinke

310	**ANALYTICAL CHEMISTRY**	Dr. W. Wayne Meinke
	Assistant Chief	Dr. Roger G. Bates
.01	Radiochemical Analysis	Dr. James R. DeVoe
.02	Spectrochemical Analysis	Bourdon F. Scribner
.03	Electrochemical Analysis	Dr. Roger G. Bates
.04	Quantitative Separations	Rolf A. Paulson (Acting)
.05	Analysis and Purification	Dr. John K. Taylor
311	**POLYMERS**	Dr. John D. Hoffman
	Consultant	Dr. John I. Lauritzen, Jr.
	Consultant on Polymers	Dr. Samuel G. Weissberg
	Consultant on Rubber	Dr. Lawrence A. Wood
.01	Macromolecules, Synthesis and Structure	Dr. Donald McIntyre
.02	Polymer Chemistry	Dr. Leo A. Wall
.03	Polymer Physics	Dr. Elio Passaglia
.04	Polymer Characterization	Dr. Norman P. Bekkedahl
.05	Dental Research	William T. Sweeney
.10	**Federal Standards and Specification Laboratory**	Dr. Robert B. Hobbs (Acting)
	Consultant on Leather	Dr. Joseph R. Kanagy
	Consultant on Mathematical Statistics	John Mandel
	Consultant on Paper	Jack L. Harvey (Acting)
	Consultant on Textiles	Dr. Herbert F. Schiefer
.11	Product Evaluation and Testing	Vacant
.12	Procurement Systems	Vacant
.13	Evaluation Criteria	Dr. Robert D. Stiehler
.14	Performance Research	Vacant
312	**METALLURGY**	Dr. Lawrence M. Kushner
	Assistant Chief	George A. Ellinger
	Consultant	Leroy L. Wyman
.01	Engineering Metallurgy	Samuel J. Rosenberg
.02	Alloy Physics	Dr. Lawrence H. Bennett
.03	Lattice Defects and Microstructures	Dr. A. William Ruff, Jr.
.04	Corrosion	George A. Ellinger
.05	Metal Physics	Dr. Robert E. Howard
.06	Electrolysis and Metal Deposition	Dr. Abner Brenner
.07	Crystallization of Metals	Dr. Robert L. Parker
313	**INORGANIC MATERIALS**	Dr. Harry C. Allen, Jr.
	Consultant	Dr. Gilbert Gordon
	Consultant	Dr. Ellis R. Lippincott
.01	Inorganic Chemistry	Dr. Thomas D. Coyle
.02	Glass	Clarence H. Hahner
.03	High Temperature Chemistry	Vacant
.04	Crystal Chemistry	H. Steffen Peiser
.05	Physical Properties	Dr. John B. Wachtman, Jr.
.06	Crystallography	Howard F. McMurdie
314	**REACTOR RADIATIONS**	Dr. Carl O. Muehlhause

*315	CRYOGENICS	Bascom W. Birmingham
	Assistant Chief	Dr. R. Joseph Corruccini
	Consultant	Alan F. Schmidt
.01	Cryogenic Technical Services	William A. Wilson
.02	Cryogenic Data Center	Victor J. Johnson
.03	Cryogenic Properties of Solids	Dr. Richard H. Kropschot
.04	Properties of Cryogenic Fluids	Dr. R. Joseph Corruccini
.05	Cryogenic Systems	Dudley B. Chelton
.06	Cryogenic Metrology	Dr. Thomas M. Flynn
.07	Cryogenic Fluid Transport Processes	Raymond V. Smith
400	INSTITUTE FOR APPLIED TECHNOLOGY	
	Director	Dr. Donald A. Schon
	Deputy Director	John P. Eberhard
	Consultant	Joseph L. Swedock
	Assistant to the Director, International Standards	Dr. Archibald T. McPherson
.01	Pilot Projects and Programs	Vacant
.02	Invention and Innovation	Daniel V. DeSimone
.03	Domestic Technology Information	Eric A. Tietz
.04	AID Technology Information	Vacant
402	OFFICE OF TECHNICAL SERVICES	Dr. Donald A. Schon
403	OFFICE OF INDUSTRIAL SERVICES	Robert L. Stern
404	OFFICE OF WEIGHTS AND MEASURES	Malcolm W. Jensen
405	OFFICE OF ENGINEERING STANDARDS	Vacant
	Commodity Standards	Alfred S. Best
	Technical Standards Coordination	Joan Hartman
410	TECHNICAL DOCUMENTATION CENTER	Bernard M. Fry
.10	Document Management Branch	Paul W. Larsen
.20	Document Analysis and Reference Branch	Lillian A. Hamrick
.30	Automated Systems and Services Branch	Vacant
.40	Customer Relations Branch	James E. Wheat
.50	Plans and Development Branch	Jeremiah F. Harrington
.60	Administrative Services Branch	John L. Demarest
.70	Joint Publications Research Service	Thomas W. Miller
421	BUILDING RESEARCH	Dr. Allan A. Bates
.01	Structural Engineering	David Watstein
.02	Fire Research	Dr. Alexander F. Robertson
.03	Mechanical Systems	Paul R. Achenbach
.04	Organic Building Materials	Dr. William W. Walton
.05	Codes and Safety Standards	Dr. Allan A. Bates (Acting)
.06	Heat Transfer	Henry E. Robinson
.07	Inorganic Building Materials	Dr. Bruce E. Foster
.08	Metallic Building Materials	Dwight G. Moore
422	INDUSTRIAL EQUIPMENT TECHNOLOGY	Vacant

423	**INFORMATION TECHNOLOGY**	Samuel N. Alexander
	PILOT	James P. Nigro
	.01 Components and Techniques	Robert D. Elbourn
	.02 Computer Technology	James A. Cunningham
	.03 Measurements Automation	Raymond T. Moore
	.04 Engineering Applications	James P. Nigro
	.05 Systems Analysis	Samuel N. Alexander (Acting)
424	**PERFORMANCE TEST DEVELOPMENT**	Vacant
425	**INSTRUMENTATION**	G. Franklin Montgomery
	.01 Engineering Electronics	Gustave Shapiro
	.02 Electron Devices	Charles P. Marsden
	.03 Electronic Instrumentation	G. Franklin Montgomery (Acting)
	.04 Mechanical Instruments	Arnold Wexler
	.05 Basic Instrumentation	Joshua Stern
426	**TRANSPORT SYSTEMS**	Dr. Siegfried M. Breuning
427	**TEXTILES AND APPAREL TECHNOLOGY CENTER**	Robert L. Stern (Acting)
	Consultant	Gary K. Stonebraker
	Mathematician	Jerome A. Yurow
	Industrial Specialist	Gary C. McKay
	Consultant	Robert H. Ramsey
	Consultant	Ernest R. Kaswell
	.01 Contract Research Program	Vacant
	.02 Technical Support Program	Vacant

*500 CENTRAL RADIO PROPAGATION LABORATORY

Director	Dr. C. Gordon Little
Deputy Director	Jack W. Herbstreit
Senior Research Fellow	Dr. James R. Wait
Consultant	Kenneth A. Norton
Consultant	Roger M. Gallet
Consultant	A. Glenn Jean, Jr.
CRPL Liaison and Program Development	Alan H. Shapley
Consultant Radio Wave Propagation	Dr. James R. Wait

***582**	**IONOSPHERE RESEARCH AND PROPAGATION**	Robert W. Knecht
	Assistant Chief	Thomas N. Gautier
	Consultant	Dr. Lawrence R. Megill
	Consultant	Dr. H. Herbert Howe
	.05 Ultra Low Frequency Research	Dr. Wallace H. Campbell
	.10 LF and VLF Research	Douglass D. Crombie
	.20 Ionosphere Research	Dr. Kenneth Davies
	.30 Prediction Services	Margo Leftin
	.40 Sun-Earth Relationships	Dr. Thomas E. VanZandt
	.50 Field Engineering	Harry G. Sellery
	.60 Radio Warning Services	J. Virginia Lincoln
	.70 Vertical Soundings Research	John W. Wright

*583	TROPOSPHERE AND SPACE TELECOMMUNICATIONS	Robert S. Kirby (Acting)
	Consultant	Dr. David M. Gates
	Consultant, Terminal Equipment	Edwin F. Florman
.10	Data Reduction Instrumentation	Walter E. Johnson
.40	Radio Noise	William Q. Crichlow
.50	Tropospheric Measurements	Martin T. Decker
.60	Tropospheric Analysis	Philip L. Rice
.70	Spectrum Utilization Research	Albrecht P. Barsis
.80	Radio Meteorology	Bradford R. Bean
.90	Lower Atmosphere Physics	Dr. Moody C. Thompson, Jr.
*585	RADIO SYSTEMS	Richard C. Kirby
	Assistant Chief	Donald W. Patterson
	Assistant Chief	William F. Utlaut
	Consultant	George W. Haydon
.10	Applied Electromagnetic Theory	J. Ralph Johler
.20	HF and VHF Research	Lowell H. Tveten
.30	Frequency Utilization	George W. Haydon
.40	Modulation Research	Clark C. Watterson
.50	Antenna Research	Herman V. Cottony
.60	Radiodetermination	Gifford Hefley
*587	UPPER ATMOSPHERE AND SPACE PHYSICS	Dr. Ernest K. Smith, Jr.
	Assistant Chief	Dr. Floyd L. Taylor
	Consultant	Dana K. Bailey
	Consultant	Dr. George C. Reid
	Consultant	Dr. Ralph J. Slutz
.10	Upper Atmosphere and Plasma Physics	Vacant
.20	High Latitude Ionospheric Physics	Dr. Hugh J. A. Chivers
.30	Atmospheric Collision Processes	Dr. Eldon E. Ferguson
.50	Ionosphere and Exosphere Scatter	Dr. Kenneth L. Bowles
.70	Airglow and Aurora	Dr. Franklin E. Roach
.80	Ionospheric Radio Astronomy	Robert S. Lawrence

*Laboratories located in Boulder, Colorado.

FIELD STATIONS

212 METROLOGY

Visual Aids Field Laboratory, Arcata, CA
Master Railway Track Scale Depot, Clearing, IL

410.70 TECHNICAL DOCUMENTATION CENTER, JOINT PUBLICATIONS RESEARCH SERVICE

San Francisco, CA
New York, NY

421.07 BUILDING RESEARCH, INORGANIC BUILDING MATERIALS

San Francisco, CA
Denver, CO
Seattle, WA

500 CENTRAL RADIO PROPAGATION LABORATORY

Radio Propagation Field Station, Anchorage, AK
Radio Propagation Field Station, Barrow, AK
Ionosonde and Conjugate Points Station, Byrd Station, Antarctica
Radio Noise Station, USNS ElTanin, Antarctica
Conjugate Points Station, Charlevoix, Quebec
Western Test Range, Lompoc (Point Arguello), CA
Radio Propagation Field Station, Akron, CO
Boulder Magnetic Observatory, Boulder, CO
Cheyenne Mountain Radio Propagation Station, Colorado Springs, CO
HF/VHF Research Section Radio Propagation Transmissions Site, Erie, CO
Standard Frequency Stations WWVB/WWVL, For Collins, CO
Antenna Research Test Site, Green Mountain Mesa, CO
Radio Meteorological Field Site, Radio Noise Station and Telemetry Recording Station, Gun Barrel Hill, CO
Radio Propagation Field Station, Haswell, CO
Ionosphere Research Field Station, Kolb, CO
VLF/ELF Propagation Station, Lafayette, CO
Fritz Peak Observatory, Aurora and Airglow Station, Rollinsville, CO
Radio Propagation Research Station, Table Mesa, CO
Radio Noise Recording Station, Koloa, Kauai, HA
Radio Propagation and Standard Frequency Station WWVH, Puunene, Maui, HA
Radio Propagation Transmissions Station, Havana, IL
Standard Frequency Station WWV, Greenbelt, MD
Radio Noise Recording Station, Warrensburg, MO
Radio Propagation Field Station, Mangum, OK
Jicamarca Radar Observatory, Lima, Peru
Radio Propagation Field Station, Ft. Belvoir, VA
Radio Noise Station, Front Royal, VA
Ionosphere Sounding Station, Wallops Island, VA
Bill Radio Noise Recording Station, Douglas, WY

The July, 1978 organizational chart reflects Director Ernest Ambler's creation of a laboratory structure.

July 1, 1978

100 Office of the Director	
Director	Dr. Ernest Ambler
Deputy Director	Dr. Thomas A. Dillon
Legal Advisor	Allen J. Farrar
Congressional Affairs Officer	Esther C. Cassidy
Equal Employment Opportunity Coordinator	Dwight F. Doxey, Acting
Technology Advisor	Dr. Howard E. Sorrows
Visiting Committee/Evaluation Panels	Kay J. Byerly
Presentations	Donald V. Baker
Industrial Liaison	Peter R. DeBruyn
State and Local Governments	James M. Wyckoff
Associate Director for International Affairs	Dr. Edward L. Brady
Office of International Relations	H. Steffen Peiser

110	**Associate Director for Programs, Budget, and Finance**	
	Associate Director	Raymond G. Kammer
111	**Program Office**	
	Chief	Raymond G. Kammer
	Program Analyst	Dr. Harvey Yakowitz
	Analyst, NML	Dr. Peter L. Heydemann
		Dr. Gregory J. Rosasco
	Analyst, NEL	Dr. Richard D. Marshall
		Judith F. Gilsinn
	Analyst, ICST	Dr. Seldon L. Stewart
	Analyst, DAIS	Stephen L. Damours
112	**Budget Office**	
	Chief	Thomas A. Gary
	Senior Analyst—Budget Formulation	Joseph E. Fones
	Senior Analyst—Budget Justification	Janet B. Miller
113	**Office of the Comptroller**	
	Comptroller	Larry D. Stout
	Deputy Comptroller	David B. Shreve
	Special Projects	Edgar H. MacArthur
	General Accounting	John C. McGuffin
	Operations	Henry L. Kenno
	Accounts Payable	Eleanor W. Filban
114	**Planning Office**	
	Chief	Raymond G. Kammer, Acting
320	**Director of Administrative and Information Systems**	
	Director	Richard P. Bartlett, Jr.
	Program Coordinator	Joseph C. Aubele
321	**Public Information Division**	
	Chief	Richard S. Franzen
	Audio/Visual Information	Ronald E. Meininger
	Media Liaison	Madeleine S. Jacobs
	Special Activities	Sara R. Torrence
322	**Personnel Division**	
	Chief	Mati Tammaru
	Deputy	Sharon April
	Labor/Management Relations	John L. O'Neill
	Personnel Operations/Boulder	James H. Spencer
	Employee Development	John C. Collins
	Classification	Walter R. Scheltema
	Operations and Procedures	Marlene O. Posey

323	**Management and Organization Division**	
	Chief	Roger A. Dixon
	Consultive Services	Wayne B. Davis
	Directives Management	Sharon B. Weeks
	Organization Design	Marguerite R. Hubanks
	Management Systems	Roger A. Dixon
340	**Center for Information Systems**	
	Chief	John T. Hall
341	**Computing Systems Design Division**	
	Chief	Eugene I. Grunby
	Advanced Systems	Edward J. Barkmeyer
	Administrative Systems Design	Robert E. Stant
	Administrative Systems Applications	Lucille E. Sithens
342	**Library Division**	
	Chief	Patricia W. Berger
	Information Services	K. J. Patrias
	Resources Development	Marvin A. Bond
343	**Office Management Division**	
	Chief	Richard de la Menardiere, Acting
	Office Support Coordinator	Frances V. Gary
	DoC Procurement Liaison	R. Keith Chandler
	Procurement	Virgella Randolph
	Forms Management	G. Fenney
	Records Management	Philip V. Proulx
	Conference Facilities	Omar K. Halmat
	Printing and Duplicating	Aaron J. Lucas
	Visual Arts	James V. Schick
344	**Technical Information and Publications Division**	
	Chief	W. Reeves Tilley
	Executive Secretary, WERB	Dr. Robert F. Blunt
	Inquiry Service	Norma E. Redstone
	Publication Production	John J. Rochford
	Electronic Typesetting	Rebecca J. Morehouse
345	**Computer Services Division**	
	Chief	Martin R. Shaver
	Deputy	Leroy M. Allison
	Customer Support	Ralph A. Palladino
	Operations	Andrew Selepak
	Technical Services	George A. Dines
	Systems Software	John A. Coffey
	Hardware Maintenance	Donald C. Jensen
350	**Center for Facilities Management**	
	Director	Karl E. Bell
	Program Coordinator	Iris M. Lloyd

351 Plant Division

Chief	John N. Brewer, Jr.
Deputy	Edmund H. Keranen
Special Projects	DeForest Z. Rathbone, Jr.
Contract Administration	Julius C. Chieppa
Industrial Planning	G. D. Scullen
Maintenance Engineering	Anthony A. White
Design Engineering	T. B. McKneely
Apprentice Programs	Robert W. Miller
Steam & Chilled Water Generation	Leslie E. Wachter
Electric Shop	Robert W. Miller
Piping Shop	Kenneth L. Lowe
Construction Shop	David W. Hughes
Paint Shop	James M. Marlett, Sr.
Sheet Metal Shop	Donald I. Thompson
Air Conditioning and Refrigeration	Dominick M. Giampietro
Grounds	Dale C. Sullivan

352 Instrument Shops Division

Chief	David S. Bettwy
Assistant	James N. Strohlein
Production Control	Ralph L. Whalen, Jr.
Engineering Design	James N. Strohlein
Scientific Instrument Shop	Stanley W. Gerner
Optical Shop	Edward P. Muth
Numerically Controlled Machines	Robert E. Lach
Specialty Shop	John R. Pidgeon
Glass Blowing Shop	Enrico N. DeLeonibus
Welding and Sheet Metal Shop	Harold E. Brown

353 Facilities Services Division

Chief	Walter J. Rabbitt
Consultants Supply	John F. Kennedy Walter C. Bonner, Jr.
Fire Protection Services	Chief Charles O. Baker
Janitorial Services	Henry J. Pulver, Acting
Mail	Margie E. Kaszuba
Materiel Support	Charles W. Castle
Physical Security	Capt. Frank Langston
Property and Stores	Mary L. Davison
SRM Support	George R. Fairchild
Telecommunications	Larry J. Loveland
Traffic Manager	Robert J. Lewis
Transportation Services	Harvey E. McCoy

354 Occupational Health and Safety Division

Chief	Lyman E. Pevey, Acting
Safety	Lyman E. Pevey
Health Physics	Dr. Abraham Schwebel
Medical Office	Dr. George Sharpe
Workers' Compensation	Janet C. Wilt

360 Boulder Executive Office

Executive Officer	Arthur R. Hauler
Financial Systems	Thomas M. Rizzi
Staff Services	Rudolf F. Meyers
Safety	Winston W. Scott, Jr.
Personnel Security	Ann B. Hamilton
Communications	Alden E. Clifford, III
Physical Security	William W. Fabing
Program Information	Ralph F. Desch
Visual Information	Darwin B. Miner

361 Boulder Supply Services Division

Chief	Johannes S. Roettenbacher
Deputy	Merle V. Gibson
Property Records	Carl B. Diechman
Property Utilization	William Kellett
Shipping and Receiving	O. Russell Dallman
Mail	Ted C. Fahrenholtz
Stores	Robert C. Damiana
Travel	Dolly A. Quate

362 Boulder Instrument Shops Division

Chief	William A. Wilson
Production Control	Kenneth L. Nuss
Mechanical Design	Victor Lecinski
Measurements	Lloyd M. Kneebone
Glass Shop	Jerry G. Shepherd
Scientific Instruments	Philip F. Biddle
Apprentice Program	Michael P. Cawley
Tool Crib	Ernest L. Rooks
Numerical Machines	Herbert H. Garing
Welding, Sheet Metal, Plating	William F. Decker

363 Boulder Plant Division

Chief	Vacant
Training Administration	Gordon W. DeKrey
Plant Engineer	Gary W. Johnson
Operations Manager	Kenneth B. Martin
Building Maintenance	Donald D. Rice
Roads and Grounds	Wilmer L. Schweikert
Custodial	Leslie C. Chance

410 Director, NBS/Boulder Laboratories

Chief	Bascom W. Birmingham
Program Coordination	Robert D. Harrington

500 National Measurement Laboratory

Director	Dr. John D. Hoffman
Deputy Director for Resources and Operations	Dr. Emanuel Horowitz
Associate Director for Long-Range Planning	Dr. David T. Goldman (Acting)
Deputy Director for Programs	Dr. Donald R. Johnson
Executive Officer	Ronald B. Johnson
Administrative Officer	Robert F. Martin
Senior Science Advisor	Dr. Hans J. Oser
Scientific Assistants	Dr. Ian R. Bartky
	Dr. Wayne A. Cassatt
	Dr. Lucy B. Hagan
	Dr. Ruth A. Haines
	Lottie T. McClendon
	Dr. Gilbert M. Ugiansky
Statistical Consultant	Dr. John Mandel

501 Office of Nondestructive Evaluation

Chief	Harry Berger

502 Office of Environmental Measurements

Chief	Dr. Cary Gravatt (Acting)
Air Programs	Vacant
Water Programs	Dr. Bruce W. Morrissey

503 Office of Standard Reference Materials

Chief	J. Paul Cali
Deputy	George A. Uriano
Chief Standards Coordinator	Robert E. Michaelis
Standards Coordinators	Robert Alvarez
	R. Keith Kirby
	William P. Reed
Technical Representative	Richard W. Seward
Marketing	Ruth H. Meyer

504 Office of Standard Reference Data

Chief	Dr. David R. Lide, Jr.
Technical Liaison	Dr. Sherman P. Fivozinsky
Data Systems Design	Dr. David R. Lide, Jr.
Energy and Environmental	Dr. Lewis H. Gevantman
Industrial Processes	Dr. Howard J. White, Jr.
Materials Utilization	Dr. Steven A. Rossmassler
Physical Sciences Data	Dr. David R. Lide, Jr.

505 Office of Measurements for Nuclear Safeguards

Chief	Dr. H. Thomas Yolken

506 Office of Recycled Materials

Chief	Dr. Donald R. Johnson, Acting

510 Associate Director for Measurement Services, NML

Associate Director	Dr. Arthur O. McCoubrey, Acting

511	**Office of Weights and Measures**	
	Chief	Albert D. Tholen, Acting
512	**Office of Measurement Services**	
	Chief	Dr. Brian C. Belanger
513	**Office of Domestic and International Measurement Standards**	
	Chief	David E. Edgerly
520	**Center for Absolute Physical Quantities**	
	Director	Dr. Karl G. Kessler
	Deputy Director	Dr. Ralph P. Hudson
	Assistant to the Director	Dr. W. Gary Schweitzer, Jr.
	Quantum Metrology Group Leader, Senior Research Fellow	Dr. Richard D. Deslattes
521	**Electrical Measurements and Standards Division**	
	Chief	Dr. Barry N. Taylor
522	**Temperature Measurements and Standards Division**	
	Chief	Dr. James F. Schooley
523	**Length and Mass Measurements and Standards Division**	
	Chief	Dr. Ralph P. Hudson, Acting
524	**Time and Frequency Division, Boulder**	
	Chief	Dr. James A. Barnes
525	**Quantum Physics Division, Boulder**	
	Chief	Dr. Gordon H. Dunn
530	**Center for Radiation Research**	
	Director	Dr. James E. Leiss
	Deputy	Dr. James A. O'Connell, Acting
	Assistant to the Director	James A. Hormuth
	Radiation Measurements	Elmer H. Eisenhower
531	**Atomic and Plasma Radiation Division**	
	Chief	Dr. Wolfgang L. Wiese, Acting
532	**Nuclear Radiation Division**	
	Chief	Dr. Randall S. Caswell, Acting
533	**Radiation Physics Division**	
	Chief	Dr. Christopher E. Kuyatt
534	**Radiometric Physics Division**	
	Chief	Dr. Jack L. Tech
535	**Radiation Source and Instrumentation Division**	
	Chief	Dr. Samuel Penner, Acting

540	**Center for Thermodynamics and Molecular Science**	
	Director	Dr. Milton D. Scheer
	Deputy Director	Dr. William H. Kirchhoff
541	**Surface Science Division**	
	Chief	Dr. Cedric J. Powell
542	**Chemical Kinetics Division**	
	Chief	Dr. Wing Tsang
543	**Chemical Thermodynamics Division**	
	Chief	Dr. David Garvin
544	**Thermophysics Division**	
	Chief	Dr. Harold J. Raveche
545	**Molecular Spectroscopy Division**	
	Chief	Dr. Merrill M. Hessel
550	**Center for Analytical Chemistry**	
	Director	Dr. Philip D. LaFleur
	Deputy	Dr. Curt W. Reimann
	Scientific Assistant to the Director	Dr. Richard A. Durst
	Service Analysis Coordinator	Dr. Robert W. Burke
	Instrument Development Group	Dr. James R. DeVoe
551	**Inorganic Analytical Research Division**	
	Chief	Dr. I. Lynus Barnes
552	**Organic Analytical Research Division**	
	Chief	Dr. Harry S. Hertz
553	**Gas and Particulate Science Division**	
	Chief	Dr. John K. Taylor
560	**Center for Materials Science**	
	Director	Dr. John B. Wachtman, Jr.
	Deputy Director	Dr. Elio Passaglia, Acting
	Assistant for Planning	Dr. Bruce W. Steiner
	Assistant for Other Agency Programs	Samuel J. Schneider
	Center Scientists	Dr. John W. Cahn
		Dr. Robb M. Thomson
	Signal Processing and Imaging	Dr. Melvin Linzer
	Fibrous Systems	Donald G. Fletcher
561	**Chemical Stability and Corrosion Division**	
	Chief	Dr. Thomas D. Coyle
562	**Fracture and Deformation Division**	
	Chief	Dr. Sheldon M. Wiederhorn

563	**Polymer Science and Standards Divison**	
	Chief	Dr. Ronald K. Eby
564	**Metal Science and Standards Division**	
	Chief	Dr. A. William Ruff, Jr., Acting
565	**Ceramics, Glass, and Solid State Science Division**	
	Chief	Dr. Hans P.R. Frederikse
566	**Reactor Radiation Division**	
	Chief	Dr. Robert S. Carter
600	**Institute for Computer Sciences and Technology**	
	Director	M. Zane Thornton, Acting
	Deputy Director	M. Zane Thornton
	Associate Director for Telecommunications	Edwin J. Istvan
	Senior Scientist for Computer Science	Dr. Joseph O. Harrison, Jr.
	Assistant for Computer Utilization	Robert P. Blanc
	Assistant for Technical Communications	Grace G. Burns
	Manager, Pattern Recognition Program	Joseph H. Wegstein
	Executive Officer	Ben C. Tate, Jr.
	Automatic Data Processing Standards	Harry S. White
		Madeleine M. Henderson
640	**Systems and Software Division**	
	Chief	Seymour Jeffrey
	Systems Architecture	Dr. Thomas C. Lowe
	Computer Science	Dr. Dennis W. Fife
	Applied Automatic Data Processing Technology	John F. Wood
650	**Computer Systems Engineering Division**	
	Chief	Thomas N. Pyke, Jr.
	Computer Systems	Raymond T. Moore
	Computer Networking	Dr. Stephen R. Kimbleton
	Data Acquisition and Storage	George E. Clark
660	**Information Technology Division**	
	Chief	M. Zane Thornton, Acting
700	**National Engineering Laboratory**	
	Director	Dr. John W. Lyons
	Deputy Director	Dr. James R. Wright
	Associate Director for Programs	Samuel Kramer, Acting
	Associate Director for Planning	Vacant
	Associate Director for Technical Evaluation	Dr. George A. Sinnott, Acting
	Executive Officer	D. Michael Stogsdill
	Administrative Officer	John M. Smith
710	**Center for Applied Mathematics**	
	Director	Dr. Burton H. Colvin
	Deputy	Dr. Joan R. Rosenblatt, Acting

711	**Mathematical Analysis Division**	
	Chief	Dr. Frederick C. Johnson, Acting
712	**Operations Research Division**	
	Chief	Dr. Alan J. Goldman
713	**Scientific Computing Division**	
	Chief	Dr. Burton H. Colvin, Acting
714	**Statistical Engineering Division**	
	Chief	Dr. Harry H. Ku, Acting
720	**Center for Electronics and Electrical Engineering**	
	Director	Judson C. French
	Deputy	Director Dr. Alvin H. Sher
721	**Electron Devices Division**	
	Chief	Dr. W. Murray Bullis
722	**Electrosystems Division**	
	Chief	Dr. Oskars Petersons, Acting
723	**Electromagnetic Fields Division, Boulder**	
	Chief	Dr. Harold S. Boyne
724	**Electromagnetic Technology Division, Boulder**	
	Chief	Dr. Robert A. Kamper, Acting
730	**Center for Mechanical Engineering and Process Technology**	
	Director	Dr. John A. Simpson
	Deputy Director	Dr. John M. Evans
731	**Mechanical Processes Division**	
	Chief	Dr. Russell D. Young, Acting
732	**Fluid Engineering Division**	
	Chief	Dr. George E. Mattingly
733	**Thermal Processes Division**	
	Chief	Dr. Kenneth G. Kreider, Acting
734	**Industrial Engineering Division**	
	Chief	Vacant
735	**Acoustical Engineering Division**	
	Chief	Dr. David S. Pallett
736	**hermophysical Properties Division, Boulder**	
	Chief	Dr. Richard H. Kropschot
740	**Center for Building Technology**	
	Director	Dr. Richard N. Wright
	Deputy	Director Harry E. Thompson
741	**Structures and Materials Division**	
	Chief	Dr. Edward O. Pfrang
742	**Building Thermal and Service Systems Division**	
	Chief	Dr. Preston E. McNall

743	**Environmental Design Research Division**	
	Chief	Dr. Francis T. Ventre
744	**Building Economics and Regulatory Technology Division**	
	Chief	James G. Gross, Acting
750	**Center for Fire Research**	
	Director	Dr. Frederic B. Clarke, III, Acting
	Deputy Director	Dr. Frederic B. Clarke, III
751	**Fire Science Division**	
	Chief	Dr. Robert S. Levine
752	**Fire Safety Engineering Division**	
	Chief	Irwin A. Benjamin
760	**Center for Consumer Product Technology**	
	Director	Dr. Stanley I. Warshaw
	Deputy Director	John L. Donaldson, Acting
761	**Consumer Sciences Division**	
	Chief	Dr. Harold P. Van Cott
762	**Product Performance Engineering Division**	
	Chief	Dr. Andrew J. Fowell
763	**Product Safety Technology Division**	
	Chief	Walter G. Leight
770	**Center for Field Methods**	
	Director	Richard T. Penn, Acting
780	**Office of Engineering Standards**	
	Director	Gene A. Rowland
	Deputy	William C. Cullen
781	**Office of Standards Development**	
	Chief	Dr. Lawrence D. Eicher
782	**Office of Testing Laboratory Technology**	
	Chief	Dr. Norman F. Somes
783	**Office of International Engineering Standards**	
	Chief	William E. Andrus, Jr.
790	**Office of Energy Programs**	
	Director	Dr. Jack E. Snell
791	**Office of Energy-Related Inventions**	
	Chief	George P. Lewett

The organizational chart for March 1991 showed the structure established by Director John W. Lyons in response to the legislation that changed the National Bureau of Standards into the National Institute for Standards and Technology.

March, 1991

100	**Office of the Director**	
	Director	Dr. John W. Lyons
	Deputy Director	Raymond G. Kammer
	Associate Director	Samuel Kramer
	Counselor to the Director	M. G. Stanley
	Congressional and Legislative Affairs	Esther C. Cassidy
102	**Office of Quality Programs**	
	Director	Dr. Curt W. Reimann
104	**Office of the Director, Boulder Laboratories**	
	Director	Dr. Robert A. Kamper
106	**Program Office**	
	Director	Elaine Bunten-Mines
	Senior Analyst	Vacant
	Senior Economist	Dr. Gregory C. Tassey
	Analyst MSEL/BFRL	Dr. David C. Cranmer
	Analyst CSL/CAML/TS	Richard J. Linn, Jr.
	Analyst EEEL/MEL	Allen C. Newell
	Analyst CSTL/PL	Robert L. Watters, Jr.
107	**Budget Office**	
	Director	Thomas A. Gary
	Justification and Analysis	Joann L. Beck
	Formulation and Financial Management Systems	Donald E. Drinkwater
108	**Office of Personnel and Civil Rights**	
	Personnel Officer	Elizabeth W. Stroud
	Demonstration Project	Allen F. Cassady
	Staff Services	H. James Reese
	Operations	Ellen M. Dowd
	Civil Rights	Alvin C. Lewis
109	**Director for International and Academic Affairs**	
	Director	Dr. George A. Sinnott
	Deputy Director for International Affairs	Dr. Kenneth F. Gordon
	Deputy Director for Academic Affairs	Dr. Burton H. Colvin
	Director, Office of International Relations	Dr. B. Stephen Carpenter
150	**Advanced Technology Program**	
	Director	George A. Uriano
	Deputy Director	Dr. Brian C. Belanger
200	**Office of the Director of Technology Services**	
	Director	Dr. Donald R. Johnson
	Deputy Director	David E. Edgerly
201	**Manufacturing Technology Centers Program**	
	Director	Dr. Philip N. Nanzetta, Acting

210	**Office of Standards Services**	
	Director	Dr. Stanley I. Warshaw
	Deputy Director	Walter G. Leight
211	**Standards Code and Information Program**	
	Chief	John L. Donaldson
212	**Standards Management Program**	
	Chief	Dr. Samuel E. Chappell
213	**Weights and Measures Program**	
	Chief	Albert D. Tholen
	Laws, Regulations, and Commodities	Dr. Carol S. Brickenkamp
	Device Technology	Henry V. Oppermann
220	**Office of Technology Commercialization**	
	Director	Dr. Cary Gravatt
221	**Research and Technology Applications Program**	
	Chief	Joseph G. Berke
222	**Technology Development and Small Business Program**	
	Chief	B. E. Mattson
230	**Office of Measurement Services**	
	Director	Stanley D. Rasberry
231	**Standard Reference Data Program**	
	Chief	Dr. Malcolm W. Chase
	Data Systems Development	Phoebe Fagan
232	**Standard Reference Materials Program**	
	Chief	Stanley D. Rasberry, Acting
	Production and Certification	Thomas E. Gills
233	**Physical Measurement Services Program**	
	Chief	Dr. Joseph D. Simmons
234	**Laboratory Accreditation Program**	
	Chief	Nancy M. Trahey
240	**Office of Technology Evaluation and Assessment**	
	Director	George P. Lewett
	Deputy Director	Dr. Jaromir J. Ulbrecht
241	**Energy-Related Inventions Program**	
	Chief	George P. Lewett, Acting

242	**Non-Energy-Related Inventions Program**	
	Chief	George P. Lewett, Acting
250	**Office of Information Services**	
	Director	Patricia W. Berger
	Information Systems	Marvin Bond
	Research Resources Development	Mary Lynn Kingston
	Research Information Services	Sami W. Klein
	Publications Production	Donald R. Harris, Acting
	WERB Secretary	Rolfe C. MacCullough
320	**Office of the Director of Administration**	
	Director	Guy W. Chamberlain, Jr.
	Deputy Director	Karl E. Bell
	Systems Analyst	David K. Wise
322	**Management and Organization Division**	
	Chief	Sharon E. Bisco
	Management Analysis	Sharon E. Bisco
	Forms and Records Management	Sue C. Cox
330	**Office of the Comptroller**	
	Comptroller	John C. McGuffin
	Cost Accounting	Kendra S. Walker
	Document Control	Velma K. Cope, Acting
	Cost Control	Carol A. Abramson
	Accounts Payable	Maurine M. Steel
	Advances and Reimbursements	John W. Wisner
	Systems	John A. Marrazzo
	Billing and Collections	Katie M. Mooney, Acting
	Accounting and Reports	Harry W. Frizzell
346	**Public Affairs Division**	
	Chief	Matthew Heyman
	Media and General Communications	Matthew Heyman, Acting
	General Publications	Sharon A. Shaffer
	Special Activities	Sara R. Torrence
	Audiovisual Communications	Ronald E. Meininger
351	**Plant Division**	
	Chief	Jorge R. Urrutia
	Steam and Chilled Water Generation	Allen M. Federline
	Electric Shop	Donald L. Bruchey
	Pipe Shop	Kenneth W. Wean
	Construction Shop	Richard L. Lantz
	Grounds and Service Support	Robert P. Holland
	Planning and Engineering	Christopher G. Conley
	Operations and Maintenance	John P. Manning
	Administrative Office	James M. Smith
	Project Management	Robert F. Moore
	Construction Contracts	Robert E. Henry
	General Foreman	Al C. Fox
	HVAC Shop	George A. Garvis

353	**Facilities Services Division**	
	Chief	Walter J. Rabbitt
	Mail and Distribution	Donna J. Aller
	Janitorial Services	Patricia A. Lynch
	Physical Security	Capt. Thomas Shackelford
	Transportation	William Cook
	Fire Protection	Chief James T. Ridgley
	Reprographics	William N. Welsh
	Conference Facilities	Omar K. Halmat
354	**Occupational Health and Safety Division**	
	Chief	Lyman E. Pevey
	Safety Office	Lyman E. Pevey
	Health Physics	Thomas G. Hobbs
	Health Unit	Lyman E. Pevey
357	**Acquisition and Assistance Division**	
	Chief	Richard E. de la Menardiere
	Procurement Data Base	R. Keith Chandler
	Contracts Office	Eli R. Arbaiza
	Grants Office	Sharon D. Green
	Purchasing Office	J. Douglas Atkins
	Supply	Charles F. Shawver
360	**Boulder Executive Office**	
	Executive Officer	Paige L. Gilbert
	Financial Information	William D. Walters
	EEO	Sheila R. Aaker
	Publications	Shirley G. Deeg
	CARE, Tours, and Exhibits	Mary Elizabeth Brunner
	Special Services	Deborah Ann Putnam
361	**Boulder Technical Services Division**	
	Chief	Henry W. Tyler
	Engineering	Hubert W. Margetts
	Operations	Stephen S. Salber
	Instrument	Shops James L. Boyd
810	**Electronics and Electrical Engineering Laboratory**	
	Director	Judson C. French
	Deputy Director	Dr. Robert E. Hebner
	Office of Microelectronics Programs	Robert I. Scace
	Office of Law Enforcement Standards	Lawrence K. Eliason
811	**Electricity Division**	
	Chief	Dr. Oskars Petersons
	Applied Electrical Measurements	Dr. William E. Anderson
	Electronic Instrumentation and Metrology	Barry A. Bell
	Electrical Reference Standards	Norman B. Belecki
	Fundamental Electrical Measurements	Dr. Alan F. Clark

812 Semiconductor Electronics Division

Chief	Frank F. Oettinger
Materials Technology	Dr. David G. Seiler
Device Technology	Dr. Herbert S. Bennett
Integrated Circuits Technology	Loren W. Linholm

813 Electromagnetic Fields Division, Boulder

Chief	Dr. Ramon C. Baird
Microwave Metrology	David H. Russell
Broadband Microwave Metrology	Dr. William A. Kissick
Fields and Interference Metrology	Dr. Motohisa Kanda
Antenna Metrology	Allen C. Newell

814 Electromagnetic Technology Division, Boulder

Chief	Dr. Robert A. Kamper
Optical Electronic Metrology	Aaron A. Sanders
Cryoelectronic Metrology	Dr. Richard E. Harris
Superconductors and Magnetic Measurements	Dr. Frederick R. Fickett

820 Manufacturing Engineering Laboratory

Director	Dr. John A. Simpson
Deputy Director	Dr. Richard H.F. Jackson
Manager, Manufacturing Programs	Dr. Philip N. Nanzetta
Manager, Industrial Relations	Dr. Merrill M. Hessel

821 Precision Engineering Division

Chief	Dr. Dennis A. Swyt
Dimensional Metrology	Ralph C. Veale
Machine Metrology	Dr. W. Tyler Estler
Micrometrology	Dr. E. Clayton Teague
Microelectronics Dimensional Metrology	Dr. Robert D. Larrabee
Surface and Particle Metrology	Dr. Theodore V. Vorburger

822 Automated Production Technology Division

Chief	Donald S. Blomquist
Mass	Donald S. Blomquist, Acting
Ultrasonic Standards	Dr. Donald G. Eitzen
Sound and Vibration	Donald S. Blomquist, Acting
Sensor Systems	Dr. M. Alkan Donmez
Sensor Integration	Kang Lee
Force	Dr. Simone Yaniv

823 Robot Systems Division

Chief	Dr. James S. Albus
Intelligent Machines Programs	Roger D. Kilmer
Performance Measures	Kenneth R. Goodwin
Intelligent Controls	Dr. Ronald Lumia
Systems Integration	Maris Juberts
Sensory Intelligence	Dr. Martin Herman
Unmanned Systems	Richard Quintero

824 Factory Automation Systems Division

Chief	Howard M. Bloom
IGES/PDES/STEP Projects	Vacant
CALS/PDES Project	Charles R. McLean
Production Management Systems	Mark E. Luce
Product Data Engineering	Cita M. Furlani
Integrated Systems	Dr. Selden L. Stewart
Machine Intelligence	Dr. Theodore H. Hopp

825 Fabrication Technology Division

Chief	Adrian W. Moll
Apprentice Program	Charles Summers
Glassblowing	Sherman Reeder
Grinding and EDM Shop	Jeffrey Kelley
Special Shops	Sherman Reeder
Optical Shop	Sherman Reeder
Planning and Estimating	Kenneth Wiltshire
Tool Crib	Kenneth Wiltshire
Metal Storeroom	Kenneth Wiltshire
Main Shop	Jeffrey Kelley
Sheet Metal and Welding Shops	Jeffrey Kelley

830 Chemical Science and Technology Laboratory

Director	Dr. Harry S. Hertz
Deputy Director for Operations	Barry I. Diamondstone
Deputy Director for Programs	Dr. Ruth A. Haines
Associate Director for Boulder Operations	Dr. James F. Ely
Senior Management Advisor	Robert F. Martin

831 Biotechnology Division

Chief	Dr. Lura J. Powell
Biochemical Measurements	Dr. Dennis J. Reeder
Biophysical Measurements	Dr. Stanley Abramowitz
Advanced Research in Biotechnology	Dr. Walter J. Stevens

832 Chemical Engineering Division, Boulder

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Transport Processes	Dr. Michael C. Jones
Systems Dynamics	James A. Brennan
Properties of Solids	Dr. Ray Radebaugh

833 Chemical Kinetics and Thermodynamics Division

Chief	Dr. Sharon Lias
Experimental Chemical Kinetics	Dr. Pierre J. Ausloos
Reference Data Centers	Dr. John T. Herron
Chemical Thermodynamics	Dr. Eugene S. Domalski

834 Inorganic Analytical Research Division

Chief	Dr. James R. DeVoe
Analytical Mass Spectrometry	Dr. John D. Fassett
Electroanalytical Research	Dr. Howard M. Kingston
Atomic and Molecular Spectrometry	Dr. John C. Travis, Acting
Nuclear Methods	Dr. Robert R. Greenberg

835	**Organic Analytical Research Division**	
	Chief	Dr. Willie E. May
	Analytical Sensors and Automation	Dr. William A. MacCrehan
	Gas Metrology Research	William D. Dorko
	Organic Mass Spectrometry	Dr. Michael J. Welch
	Separation Science	Dr. Stephen A. Wise
836	**Process Measurements Division**	
	Chief	Dr. Hratch G. Semerjian
	Fluid Flow	Dr. George E. Mattingly
	High Temperature Processes	Dr. Andrej Macek
	Reacting Flows	Dr. Gregory J. Rosasco
	Process Sensing	Dr. James R. Whetstone
	Thermometry	Dr. Billy W. Mangum
837	**Surface and Microanalysis Science Division**	
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	Atmospheric Chemistry	Dr. Lloyd A. Currie
	Microanalysis Research	Dr. Dale E. Newbury
	Surface Dynamical Processes	Dr. Richard Cavanagh
	Surface Spectroscopies and Standards	Dr. Cedric Powell
838	**Thermophysics Division, Gaithersburg and Boulder**	
	Chief	Dr. Richard F. Kayser
	Theory of Fluids	Dr. James F. Ely
	Properties of Fluids	Dr. William M. Haynes
	Fluid Science	Dr. Michael R. Moldover
	Pressure	Dr. Charles D. Ehrlich
	Vacuum	Dr. Charles R. Tilford
	Subsecond Thermophysics	Dr. Ared Cezairliyan
840	**Physics Laboratory**	
	Director	Dr. Katherine B. Gebbie
	Deputy Director	Dr. William R. Ott
841	**Electron and Optical Physics Division**	
	Chief	Dr. Charles W. Clark
	Photon Physics	Dr. Thomas B. Lucatorto
	Far Ultraviolet Physics	Dr. Robert P. Madden
	Electron Physics	Dr. Robert J. Celotta
842	**Atomic Physics Division**	
	Chief	Dr. Wolfgang L. Wiese
	Atomic Spectroscopy	Dr. William C. Martin
	Atomic Radiation Data	Dr. Yong-Ki Kim
	Plasma Radiation	Dr. James R. Roberts
	Laser Cooled and Trapped Atoms	Dr. William D. Phillips
843	**Molecular Physics Division**	
	Chief	Dr. Alfons Weber
	High Resolution Spectroscopy	Dr. Alfons Weber
	Molecular Dynamics	Dr. Alfons Weber
	Molecular Theory	Dr. Alfons Weber

844 Radiometric Physics Division

Chief	Dr. Klaus D. Mielenz
Spectral Radiometry	Dr. Albert C. Parr
Spectrophotometry	Dr. Jack J. Hsia
Thermal Radiometry	Robert D. Saunders

845 Quantum Metrology Division

Chief	Dr. Richard D. Deslattes
X-Ray Spectroscopy	Dr. Richard D. Deslattes
Synchrotron X-Ray Physics	Dr. Richard D. Deslattes

846 Ionizing Radiation Division

Chief	Dr. Randall S. Caswell
Radiation Measurements	Dr. Bert M. Coursey, Acting
Radiation Interactions and Dosimetry	Dr. Bert M. Coursey
Neutron Interactions and Dosimetry	Dr. James A. Grundl
Radioactivity	Dr. Dale D. Hoppes

847 Time and Frequency Division, Boulder

Chief	Dr. Donald B. Sullivan
Fort Collins Station	James C. Maxton
Hawaii Station	Noboru Hironaki
Ion Storage	Dr. David J. Wineland
Atomic Beam Standards	Dr. Robert E. Drullinger
Phase Noise Measurements	Dr. Fred L. Walls
Time and Frequency Services	D. Wayne Hanson
Time Scale and Coordination	David W. Allan
Laser Spectroscopy	Dr. Kenneth M. Evenson
Geophysical Measurements	Dr. Judah Levine
Optical Frequency Measurements	Dr. Leo Holberg

848 Quantum Physics Division, Boulder

Chief	Dr. David W. Norcross
Fundamental and Precision Measurements	Dr. David W. Norcross
Chemical Physics	Dr. David W. Norcross
Atomic and Molecular Collisions	Dr. David W. Norcross
Astrophysics Measurements	Dr. David W. Norcross

849 Radiation Source and Instrumentation Division

Chief	Dr. Philip H. Debenham
Accelerator Research	Dr. Mark A. Wilson
Free-Electron Laser Development	Dr. Ronald G. Johnson
Electronics Instrumentation	Julian K. Whittaker
Mechanical Instrumentation	David L. Mohr

850 Materials Science and Engineering Laboratory

Director	Dr. Lyle H. Schwartz
Deputy Director	Dr. Harry L. Rook
Scientific Advisors to the Director	Dr. Daniel B. Butrymowicz
	Dr. James G. Early
	Samuel J. Schneider
	Dr. Bruce W. Steiner

851	**Office of Nondestructive Evaluation**	
	Chief	Dr. H. Thomas Yolken
852	**Ceramics Division**	
	Chief	Dr. Stephen M. Hsu
	Powder Synthesis and Characterization	Dr. Subhaschandra G. Malghan
	Mechanical Properties	Dr. David C. Cranmer
	Tribology	Dr. Said Jahanmir
	Electronic Materials	Dr. Stephen Freiman
	Optical Materials	Dr. Albert Feldman
	Materials Microstructural Characterization	Dr. Gabrielle G. Long
853	**Materials Reliability Division, Boulder**	
	Chief	Dr. Harry I. McHenry
	Cryogenic Materials	Dr. Harry I. McHenry, Acting
	Nondestructive Evaluation	Dr. Alfred V. Clark
	Welding	Dr. Thomas A. Siewart
854	**Polymers Division**	
	Chief	Dr. Leslie E. Smith
	Specialty Polymers	Dr. G. Thomas Davis
	Chemical Performance	Dr. Francis W. Wang
	Mechanical Performance	Dr. Bruno M. Fanconi
	Polymer Composites	Dr. Donald L. Hunston
	Polymer Blends and Solutions	Dr. Charles C. Han
	Dental and Medical Materials	Dr. John A. Tesk
855	**Metallurgy Division**	
	Chief	Dr. E. Neville Pugh
	Magnetic Materials	Dr. Lawrence H. Bennett
	Metallurgical Processing	Dr. John R. Manning
	High-Temperature Materials Chemistry	Dr. John W. Hastie
	Mechanical Properties and Performance	Dr. Leonard Mordfin
	Corrosion	Dr. Richard E. Ricker
	Electrodeposition	Dr. David S. Lashmore
	Metallurgical Sensing and Modeling	Dr. H. Thomas Yolken, Acting
856	**Reactor Radiation Division**	
	Chief	Dr. J. Michael Rowe
	Reactor Operations and Engineering	Tawfik M. Raby
	Neutron-Condensed Matter Science	Dr. John J. Rush
	Cold Neutron Project	Dr. J. Michael Rowe
860	**Building and Fire Research Laboratory**	
	Director	Dr. Richard N. Wright
	Deputy Director	Dr. Jack E. Snell
	Assistant Director	James G. Gross
	Office of Technology Transfer	Richard W. Bukowski

861	**Structures Division**	
	Chief	Dr. Hai S. Lew
	Structural Evaluation	Dr. Hai S. Lew
	Earthquake Engineering	Dr. Hai S. Lew
862	**Building Materials Division**	
	Chief	Dr. Geoffrey J. Frohnsdorff
	Organic Building Materials	Lawrence W. Masters
	Inorganic Building Materials	Dr. James R. Clifton
	Construction Materials Reference Laboratories	James H. Pielert
863	**Building Environment Division**	
	Chief	Dr. James E. Hill
	Thermal Machinery	Dr. David A. Didion
	Mechanical Systems and Controls	Dr. George E. Kelly
	Heat Transfer	Dr. A. Hunter Fanney
	Computer Integrated Construction	Dr. Kent A. Reed
	Indoor Air Quality and Ventilation	Dr. Andrew K. Persily
	Lighting	Dr. Belinda L. Collins
864	**Fire Science and Engineering Division**	
	Chief	Dr. Andrew J. Fowell
	Building Fire Physics	Dr. John H. Klote
	Combustion and Flammability	Dr. Takashi Kashiwagi
	Fire Dynamics	Dr. Henri E. Mitler
865	**Fire Measurement and Research Division**	
	Chief	Dr. Richard G. Gann
	Smoke Dynamics Research	Dr. William M. Pitts
	Fire Toxicity Measurement	Dr. Vytenis Babrauskas
	Fire Hazard Analysis	Dr. Walter W. Jones
	Fire Suppression Research	Dr. David D. Evans
870	**Computer Systems Laboratory**	
	Director	James H. Burrows
	Associate Director for Computer Security	F. Lynn McNulty
	Voluntary Standards Liaison	Robert Rountree, Jr.
	Program Coordination and Support	Shirley M. Radack
	Standards Processing Coordinator	Barbara L. Blickenstaff
	Senior Management Advisor	Judith L. Lyons
871	**Information Systems Engineering Division**	
	Chief	Dr. David K. Jefferson
	Database and Graphics	Joseph C. Collica
	Data Administration	Bruce K. Rosen
	Graphics Software	Mark W. Skall
	Software Standards Validation	L. Arnold Johnson
872	**Systems and Software Technology Division**	
	Chief	Allen L. Hankinson
	Software Engineering	Roger J. Martin
	Office Systems Engineering	Lawrence A. Welsch

873	**Computer Security Division**	
	Chief	Dr. Stuart W. Katske
	Computer Security Management and Evaluation	Dennis D. Steinauer
	Security Technology	Miles E. Smid
	Protocol Security	Robert Rosenthal
	Computer Security Planning and Assistance	Eugene F. Troy
874	**Systems and Network Architecture Division**	
	Chief	Kevin L. Mills
	Network Applications	Gerard F. Mulvenna
	Automated Protocol Methods	Kevin L. Mills, Acting
	Network Management	Frances H. Nielsen
	Network Protocols	Richard P. Colella
875	**Advanced Systems Division**	
	Chief	Shukri A. Wakid
	Speech Recognition	David S. Pallett
	Parallel Processing	Robert J. Carpenter
	Data Storage	Dana S. Grubb
	Distributed Systems	Wayne McCoy
	Image Recognition	Dr. Charles L. Wilson
	Advanced Communications	David H. Su
880	**Computing and Applied Mathematics Laboratory**	
	Director	Dr. Francis E. Sullivan
	Deputy Director	Dr. Joan R. Rosenblatt
	Assistant Director for Boulder	Dr. John A. Brown
	Associate Director for Computing	Dr. Frederick C. Johnson
	Assistant Director for Management Information Technology	Dr. Alvin H. Sher
	Office of Applied Economics	Dr. Harold E. Marshall
881	**Applied and Computational Mathematics Division**	
	Chief	Dr. Paul T. Boggs
	Mathematical Modeling and Software-Gaithersburg	Dr. James L. Blue
	Mathematical Modeling and Software-Boulder	Dr. John M. Gary
	Microprocessor	Dr. David K. Kahaner, Acting
	Numerical Optimization	Dr. Paul T. Boggs
882	**Statistical Engineering Division**	
	Chief	Dr. Robert J. Lundegard
	Statistical Engineering-Boulder	Dr. Dominic F. Vecchia

883 Scientific Computing Environments Division

Chief	Dr. Sally E. Howe
User and Software Support	Dr. Sally E. Howe, Acting
Advanced Distributed Computing Systems	Robert J. Crosson
Scientific Visualization	Dr. Howland A. Fowler

884 Computer Services Division

Chief	Martin R. Shaver
Assistant Chief for Boulder Operations	Robert Wang
Gaithersburg Operations	Paul M. Johnson
Communications and Engineering	Jack L. Newmeyer
Scientific Systems Software	John A. Coffey
Technical Services	George A. Dines
User Service and Systems Support-Boulder	Mary E. McClanahan

885 Computer Systems and Communications Division

Chief	Stephen White
Network Engineering-Gaithersburg	Craig W. Hunt
Telecommunications-Gaithersburg	Lawrence J. Loveland
Network Engineering-Boulder	F. Michael Maish
Telecommunications-Boulder	Judith V. Sorg

886 Information Systems Division

Chief	Patsy B. Saunders
PC Assistance and Maintenance	Patsy B. Saunders
User Information and Database	Robert Lee
Systems Design and Programming	Gordon B. Gipe

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