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 electro-motive 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.

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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.

* * * *
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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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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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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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 non-exclusive, 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 . . .

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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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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

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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.

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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;

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“(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

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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.

* * * *


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.

800
NATIONAL BUREAU OF STANDARDS

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

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.

* * * *
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.

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)


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 89-563

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)


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 officers and offices of the Department of Commerce under—

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


* * * * *


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.

803
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)

* * * * *

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."

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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. 271-278c).

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.

* * * *


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.

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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)

* * * * *


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)

* * * * *

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).

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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 biological and physiological effects of toxic substances encountered in fires;

"(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).

* * * * *


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)

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813

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.

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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.

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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.

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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.

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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......

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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.

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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.

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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.

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816

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 applicability 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.

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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.

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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.


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: "(I) $25,000 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."


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.

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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."

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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...

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819

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....

* * * * *


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.....

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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

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....


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.

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.

* * * *


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...

* * * *


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) ...$2,575,000 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.

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822

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.

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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.

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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.

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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.

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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.

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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....

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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 Services 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....

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"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...."

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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 as-
surance techniques;
"(4) cooperate with the States in securing uniformity in weights and measures laws and methods of in-
spection;
"(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 tech-
nologies for traditional and new products and for improved production and manufacturing;
"(8) study and develop fundamental scientific understanding and improved measurement, analysis, synthe-
sis, 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 pro-
tect people, structures, and equipment from their harmful effects;
"(10) determine the atomic and molecular structure of matter, through analysis of spectra and other meth-
ods, 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 perfor-
manee 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 standardiza-
tion and most effective use, including investigation of fire-resisting properties of building materials and con-
ditions 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 assis-
tance 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 trans-
fer, 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

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“(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-Wydlner 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-Wydlner 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 simulation 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 PROGRAM.

(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-Wyler 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.

"(c) 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.

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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
The President shall, to the extent possible, 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.

Section 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.
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 statute 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(c)(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 are 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.”

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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-
priet 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:

(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:

(c) DUTIES. —Section 5(c) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704(c)) is amended—

(d) CONFORMING AMENDMENTS. —

(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.

SEC. 303. DISTRIBUTION OF ROYALTIES.

(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.

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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.

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.

Public Law 101-162

AN ACT

(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.

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.

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....

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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...

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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.

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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.

(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.

* * * *


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.

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PUBLIC LAW 101-549—NOVEMBER 15, 1990

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, ....."

* * * * *

PUBLIC LAW 101-574—NOVEMBER 16, 1990

AN ACT

To amend the Small Business Act and the Small Business Investment Act of 1958, and for other purposes.


(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.

* * * * *

PUBLIC LAW 101-592—NOVEMBER 16, 1990

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.

* * * * *


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 appropriate private sector organizations to develop seismic safety standards and practices for new and existing lifelines.


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 ...

* * * *


Public Law 102-194

AN ACT

To provide for a coordinated Federal program to ensure continued United States leadership in high-performance computing.

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


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.

* * * * *


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:

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(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.


(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.”


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.”.
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(c) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(c)) is amended to read as follows:

“(c) 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.”

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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...

* * * * *


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.)

   Index
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.

Table of Contents
1. The Overall Program (5 pp.)
2. The Atomic Bomb (9 pp.)
3. The Air Burst Proximity Fuze (13 pp.)
4. Guided Missiles (4 pp.)
5. Radio Propagation, Radio, Radar (9 pp.)
6. Quartz Crystals (5 pp.)
7. Electricity (10 pp.)
8. Aerodynamic and Aircraft Problems (12 pp.)
9. Fuels and Lubricants (8 pp.)
10. Mechanics, Structural Engineering, Hydraulics (14 pp.)
11. Optics, Color, Light (15 pp.)
12. High Polymers (21 pp.)
13. Ceramics, Metals, Alloys (22 pp.)
15. Scientific Services and Consultation (10 pp.)

Appendix
Scientific and Technical Divisions and Sections (2 pp.)
No Index was included with the text.

4. The Story of Standards
John Perry
Funk & Wagnalls, 1955
271 pp.

Table of Contents
1. Too Many Feet (15 pp.)
2. The Artful Chiselers (14 pp.)
3. Great Vexation of the King's Subjects (11 pp.)
4. Art Into Science (13 pp.)
5. Mr. Hassler's Standards (17 pp.)
6. The Great Metric Controversy (20 pp.)
7. Measuring the Invisible (18 pp.)
8. The Sun Is Obsolete (12 pp.)
9. The Meaning of Standards (16 pp.)
10. The Electrical Century (14 pp.)
11. For Consumers and Citizens (16 pp.)
12. The Indispensable Warrior (16 pp.)
13. The Crisis in Science (24 pp.)
14. New Standards (19 pp.)
15. Machines With Memories (23 pp.)
16. Uniform, Permanent, Universal (12 pp.)

Index
5. Measures For Progress: A History of the National Bureau of Standards
Rexmond C. Cochrane
703 pp.

Table of Contents
1. At the Turn of the Century (48 pp.)
2. Founding the NBS (1901-1910) (55 pp.)
3. Electricity, Railroads, and Radio (1911-1916) (56 pp.)
4. The War Years (1917-1919) (62 pp.)
5. The Tide of Commerce and Industry (1920-1930) (78 pp.)
6. The Time of the Great Depression (1931-1940) (66 pp.)
7. World War II Research (1941-1945) (62 pp.)
8. The New World of Science (1946-1951) (68 pp.)
The Crucial Decade—An Envoi (20 pp.)

Appendices
A. F. A. Hassler, First Superintendent of the Coast Survey and of Weights and Measures (12 pp.)
B. The Metric System in the US (10 pp.)
C. Basic Legislation Relating to the NBS (18 pp.)
D. U.S. Presidents, Department Secretaries, and NBS Directors (2 pp.)
E. Members of the Visiting Committee (2 pp.)
F. NBS Support, 1902-55 (2 pp.)
G. NBS Special Appropriations, 1910-1935 (2 pp.)
H. NBS Authorized Personnel (2 pp.)
I. Types of Staff Publications (4 pp.)
J. Division and Section Chiefs as of July 1, 1905; Sept 1, 1910; July 1, 1915; Jan 1, 1920; Feb 1, 1925; Apr 1, 1930; Nov 15, 1934; May 1, 1940; July 1, 1945; Mar 1, 1950; Oct 1, 1954; Dec 1, 1960. (1st WW) Wartime projects as of Sept 1, 1918 (62 pp.)
K. NBS Publications Representing Research Highlights, 1901-1951 (18 pp.)
L. Land Purchases at Van Ness Site (2 pp.)
M. S. W. Stratton, First Director, NBS (12 pp.)
N. Books By NBS Staff, 1912-1960 (6 pp.)
O. Buildings & Structures on Van Ness Site (4 pp.)

Bibliography (10 pp.)

Index

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
842 pp.

Table of Contents
I. Man’s Quest to Communicate Through Space (28 pp.)
II. The Early Years of Radio at NBS (20 pp.)
III. Fighting a War With Hertzian Waves (20 pp.)
IV. The Bureau of Standards Lends a Hand (30 pp.)
V. Applying the Measuring Stick (16 pp.)
VI. Antennas, Instruments, and Systems in Development (56 pp.)
Table of Contents
1. NBS at Mid-Century (70 pp.)
2. Testing Can Be Troublesome (66 pp.)
3. Divestiture and Reaffirmation, 1950-1957 (150 pp.)
4. Reorientation and Reconstitution, 1958-1964 (166 pp.)

Appendices
A. Tables (2 pp.)
B. Acronyms Dictionary (4 pp.)
C. Legislation Relating to the Organization, Functions, and Activities of NBS (52 pp.)
D. NBS in the Federal Administration (2 pp.)
E. Appropriations and Expenditures Charts (4 pp.)
F. NBS Visiting Committee Membership (4 pp.)
G. NBS Authorized Personnel Chart (2 pp.)
H. NBS/NIST Publications (18 pp.)
I. NBS Organizational Levels (88 pp.)
J. Gaithersburg and Boulder Site Maps (6 pp.)

Bibliography

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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 ex-erected supervisory authority over NBS/NIST. Beginning with the appointment of Craig R. Schaeffer 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.

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<td>Warren G. Harding 1921-1923</td>
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UNITED STATES PRESIDENTS

Harry S. Truman
1945-1953

Dwight D. Eisenhower
1953-1961

John F. Kennedy
1961-1963

Lyndon B. Johnson
1963-1969

DEPARTMENTAL OFFICIALS

Henry A. Wallace
Secretary of Commerce
1945-1946

W. Averell Harriman
Secretary of Commerce
1946-1948

Charles W. Sawyer
Secretary of Commerce
1948-1953

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
1962

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

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

NBS/NIST DIRECTORS

Edward U. Condon
1945-1951

Allen V. Astin
1951-1969
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APPENDIX D

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<td>Supply and Plant</td>
<td>6-18-62</td>
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<td>Steam and Chilled Water</td>
<td>7-19-61</td>
<td>7-21-64</td>
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<td>305</td>
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<td>308</td>
<td>Bowman House</td>
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<td>~1953</td>
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<td>309</td>
<td>Grounds</td>
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<td>310</td>
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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
## BUILDINGS AND STRUCTURES OF THE NATIONAL BUREAU OF STANDARDS
### BOULDER, COLORADO
#### 1970

<table>
<thead>
<tr>
<th>Building*</th>
<th>Name</th>
<th>Date (in operation)</th>
<th>Assignable Square Feet</th>
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<tr>
<td>B1</td>
<td>Radio Building: Library, Auditorium, Center Spine, Wing 1, Wing 2, Wing 3, Wing 4</td>
<td>1954</td>
<td>200,257</td>
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<tr>
<td>B1</td>
<td>Wing 5</td>
<td>1962</td>
<td>77,928</td>
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<td>B1</td>
<td>Wing 6</td>
<td>1959</td>
<td>26,000</td>
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<td>B2</td>
<td>Cryogenics, South and North Half</td>
<td>1952</td>
<td>45,702</td>
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<td>B2</td>
<td>Cryogenics, Wing “B”</td>
<td>1962</td>
<td>9,800</td>
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<td>B3</td>
<td>Liquefier</td>
<td>1952</td>
<td>20,024</td>
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<td>B4</td>
<td>Camco</td>
<td>1951</td>
<td>15,403</td>
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<td>B5</td>
<td>Heavy Equipment</td>
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<td>B8</td>
<td>Cryogenic Mesa Test Site</td>
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<td>B9</td>
<td>Gas Meter</td>
<td>1958</td>
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<td>B10</td>
<td>Green Mountain Antenna Building</td>
<td>1958-1973</td>
<td>209</td>
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<td>B11</td>
<td>Vertical Incidence</td>
<td>1958</td>
<td>408</td>
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<td>B14</td>
<td>Field Strength Calibration</td>
<td>1958</td>
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<td>B17</td>
<td>Hydrogen Storage Tanks</td>
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<td>Tube Tanks (Hydrogen) Storage</td>
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<td>Maintenance Garage</td>
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<td>Warehouse</td>
<td>1964</td>
<td>17,280</td>
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<td>Cooling Tower</td>
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<td>B24</td>
<td>Plasma Physics(^1)</td>
<td>1967</td>
<td>27,328</td>
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<td>B25</td>
<td>North Shop</td>
<td>1966</td>
<td>3,200</td>
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<td>B26</td>
<td>Ground Scanner Site</td>
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<td>High Frequency Field Site</td>
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<td>B28</td>
<td>Microwave Antenna Range</td>
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</table>

**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.
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.


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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.

<table>
<thead>
<tr>
<th>Name</th>
<th>University</th>
<th>NBS/NIST Advisor</th>
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<tr>
<td>Donald W. Alderman</td>
<td>Cornell U.</td>
<td>Robert J. Mahler</td>
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<tr>
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<td>Chester H. Page</td>
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<td>Gabriel L. Epstein</td>
<td>U. of California/Berkeley</td>
<td>Joseph Reader</td>
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<td>Benjamin Gibson</td>
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<td>Michael Danos</td>
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<td>Roger A. Hegstrom</td>
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<td>Jon H. Shirley and</td>
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<td>John W. Knoeck</td>
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<td>Richard P. Reed</td>
</tr>
<tr>
<td>Hassell M. Ledbetter</td>
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<td>John K. Taylor</td>
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<td>Morris Newman</td>
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<td>John J. Rush</td>
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<td>Pierre Ausloos</td>
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<td>Nordulf W.G. Debye</td>
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Bruce W. Morrissey  
Donald W. Regula  
Michael W. Schuyler  
Mark E. Sheingorn  
Carroll A. Shelton  
Siegfried Treu  

U. of Minnesota  
U. of Hawaii  
U. of Virginia  
U. of Michigan  
Cornell U.  
Northwestern U.  
George Washington U.  
U. of California/Berkeley  
Georgetown U.  
Rensselaer Polytechnic Institute  
Wayne State U.  
Indian U.  
U. of Wisconsin  
U. of Pittsburgh  

1971  
John H. Albers  
George H. Atkinson  
Frank P. Billingsley  
Marvin Bishop  
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James F. Ely  
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Camden R. Hubbard  
Charles E. Hughes  
Joel F. Liebman  
James J. Murphy  
Robert C. Reno  
Raymond C. Sansing  
Emil Simiu  
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Arthur D. Yaghjian  
Gerald A. Zerdy  

Massachusetts Institute of Technology  
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U. of Illinois  
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Southern Methodist U.  
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U. of California/Irvine  
Brown U.  
U. of Maryland  

1972  
Robert E. Berger  
William J. Boettinger  
Lawrence S. Cardman  
Richard S. Davis  
John R. Eyler  
James C. Holste  
Charles R. Johnson  
James R. Lyerla, Jr.  
George W. Mulholland  
Edwin R. Naimon  
Charles A. Nelson  
Dale E. Newbury  
James D. Olson  
Michael G. Reimer  

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Johns Hopkins U.  
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California Institute of Technology  
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Cornell U.  
U. of Illinois  
U. of Maryland  
U. of Oxford, England  
Michigan State U.  
U. of Pennsylvania  

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Johns Hopkins U.  
Yale U.  
U. of Maryland  
Stanford U.  
Iowa State U.  
California Institute of Technology  
U. of Utah  
Cornell U.  
U. of Illinois  
U. of Maryland  
U. of Oxford, England  
Michigan State U.  
U. of Pennsylvania  

884
Michael S. Soren
Carl F. Subrentrauch
Daniel M. Sweger
E. Clayton Teague
Tommy C. Tong
James C. Tsang

Michael S.
Carl F.
Daniel M.
E. Clayton
Tommy C.
James C.

Stanford U.
U. of Michigan
American U.
North Texas State U.
U. of Michigan
Massachusetts Institute of Technology

Donald A. Jennings
Ramon C. Baird
John C. Travis and
James J. Rhyne
Russell D. Young
David M. Kerns
Hans P. R. Frederikse

1973

Edwin D. Cehelnik
Frank O. Clark
Harry J. Dewey
Robert E. Drulinger
John W. Ekin
Barry L. Farmer
John P. Ferraris
Edwin R. Fuller, Jr.
Robert J. Hocken
David E. Laughlin
Larry L. Lucas
Jon J. McCarthy
Evelyn M. Rockar
Douglas R. Shier
Allen R. Siedle
James J. Snyder
Marjorie L. Stein
Roger L. Stockbauer
Nicholas Vagelatos
Bernard A. Weinstein
William F. Weston
John T. Yue

Edwin D.
Frank O.
Harry J.
Robert E.
John W.
Barry L.
John P.
Edwin R.
Robert J.
David E.
Larry L.
Jon J.
Evelyn M.
Allen R.
James J.
Marjorie L.
Roger L.
Nicholas
Bernard A.
William F.
John T.

Pennsylvania State U.
U. of Virginia
U. of Utah
Columbia U.
Cornell U.
Case Western Reserve U.
John Hopkins U.
U. of Illinois
State U. of New York/Stony Brook
Massachusetts Institute of Technology
U. of California/Davis
Iowa State U.
U. of California/Riverside
U. of London, England
Indiana U.
State U. of New York/Stony Brook
Princeton U.
U. of Chicago
U. of Michigan
Brown U.
U. of Illinois
Stanford U.

Oscar Menis
Donald R. Johnson
Richard D. Deslattes
Earl W. Smith
Robert L. Powell
Ronald K. Eby
Martin G. Broadhurst
Sheldon M. Wiederhorn
Johanna M. H. Levelt Sengers
Robert L. Parker
Wilfrid B. Mann
Evans V. Hayward
Herbert S. Bennett
and Richard A. Forman
Alan J. Goldman
Thomas D. Coyle
Peter L. Bender
Burton H. Colvin and
Alan J. Goldman
Henry M. Rosenstock
John J. Rush
Richard A. Forman
Richard P. Reed
J. William Gadzuk

1974

Robert S. Butler
Ilan S. Chabay
Robert B. Feinberg
Ronald F. Fleming
Robert B. Green
Joseph W. Haus, Jr.
Jan F. Herbst
Warren W. Johnson
Nell D. Lerner
Rodney A. McKee
Eric B. Miller
Harry Morgan
John A. Mucha
George E. Parris
Richard J. Pearson, Jr.
Bruce J. Pletka
David T. Read
William L. Rowan

Robert S.
Ilan S.
Robert B.
Ronald F.
Robert B.
Joseph W.
Jan F.
Warren W.
Nell D.
Rodney A.
Eric B.
Harry
John A.
George E.
Richard J.
Bruce J.
David T.
William L.

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U. of Chicago
U. of Wisconsin
U. of Michigan
Ohio U.
Catholic U. of America
Cornell U.
Rutgers U.
Brown U.
U. of Texas
Duke U.
Howard U.
U. of Pittsburgh
Georgia Institute of Technology
Harvard U.
Case Western Reserve U.
U. of Illinois
U. of Texas

Paul F. Roth
Wayne A. Cassatt, Jr.
Morris Newman
Ivan G. Schroder
John C. Travis
Harold J. Raveche
J. William Gadzuk
Michael C. Jones
Martin Greenspan
John R. Manning
....
Kenneth A. Evenson
Frederick E. Brinckman
Frank J. Lovas
Sheldon M. Wiederhorn
Richard P. Reed
Wolfgang L. Wiese
Peter J. Slater  
Samuel R. Stein  
John B. West

1975

Dennis M. Breiter  
Jason Gait  
Karla L. Hoffman  
Duane R. Kirklin  
William F. Koch  
David S. Malkus  
Ronald G. Manning  
Herbert A. Robinson  
Paul M. Skarstad  
Richard D. Suenram

1976

Bruce J. Ackerson  
Dennis R. Dietz  
Edward T. Dressler  
Pashang Esfandiari  
David D. Evans  
Robert M. Garvey  
David W. Goodman  
Robert R. Greenberg  
Dane L. Harwood  
Robert H. Havemann  
Frank P. Higgins  
Richard L. Kautz  
Marvin D. Kemple  
Eric C. Kintner  
Donald C. Knauss  
John R. Long  
Richard I. Martinez  
Gregory B. McKenna  
Ronald G. Munro  
Robert S. Polvani  
John F. Rabolt  
James C. Rainwater  
Gary L. Ritter  
David M. Shold  
John A. Small  
Terry R. Todd  
William N. Unerti

1977

James E. Bond  
Brian M. Ditche  
Flonnie Dowell  
Michael C. Drake  
Brett I. Dunlap  
William L. Earl  
Richard J. Fields  
Gordon E. Fish

Alan J. Goldman  
Helmut Hellwig  
Jerry P. Eaton  
Kurt F. J. Heinrich  
Hans J. Oser  
Alan J. Goldman  
Stanley Abramowitz  
Robert J. Cutkosky  
Jeffrey T. Fong  
John T. Herron  
Morris Newman  
Robert S. Roth  
Donald R. Johnson  
Gerald C. Straty  
Melvin Linzer  
James S. O’Connell  
Johanna M. H. Levelt Sengers  
Clayton Huggett  
Helmut Hellwig  
John T. Yates, Jr.  
Philip D. Laflleur  
Edward B. Magrab  
Robert J. Phelan, Jr.  
Melvin Linzer  
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Christoph J. Witzgall
James J. Rhyne

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**1980**

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Daniel J. Heinzen Massachusetts Institute of Technology Johanna M. H. Levelt Sengers
Martin E. Huber Stanford U. James C. Bergquist
Catheryn L. Jackson U. of Connecticut Michael W. Cromar
Gregg M. Jankowski Michigan Technical U. Gregory B. McKenna
Peter J. Martin Massachusetts Institute of Technology Richard J. Fields
Christopher W. Meyer U. of California/Santa Barbara John L. Hall
Paul J. Miller Yale U. Michael R. Moldover
Bruce T. Murray U. of Arizona Stephen R. Leone
Lee J. Richter Cornell U. Geoffrey B. McFadden
Jamal A. Sandarasi Colorado School of Mines Richard R. Cavanagh
William M. Haynes

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<th>Name</th>
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<td>Ray E. Snyder</td>
<td>Stanford U.</td>
<td>Hratch G. Semerjian</td>
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<td>Mark A. Sobolewski</td>
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<td>Stephen Semancik</td>
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<td>Carol E. Tanner</td>
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<td>Stephen A. Angel</td>
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<td>John C. Stephenson</td>
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<td>E. Clayton Teague</td>
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<td>Kevin A. Sparks</td>
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<td>Paul G. Strupp</td>
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<td>Lorraine E. Twerdok</td>
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<td>Barry J. Wyhoff</td>
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<td>Michael P. Casassa</td>
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<td>David S. Alavi</td>
<td>U. of Pittsburgh</td>
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<td>Gary L. Gilliland</td>
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<td>Massachusetts Institute of Technology</td>
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<td>Edward A. Early</td>
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Jonathan Timothy John Russell Peter Jack Gregory Brooks William Thomas Thomas Kevin William Mark Karl Cynthia Joel Lon Ofodike Levent Acar Roger John Thaddeus Tarpey Jonathan Joseph Laura David Steven Warren Christopher John Daniel Josell Alan Steven James Andrew Michael Collison Mark Mun Jeffrey Anne Carmela Austin

1992

Ofodike A. Ezekoye
Timothy J. Foecke
Jonathan M. Gilligan
Lori S. Goldner
Joel E. Harrington
Cynthia D. Holcomb
Karl K. Irikura
Mark T. Kief
William E. Luecke
Kevin B. McGrattan
Thomas H. McWaid
Thomas R. O'Brien
William J. Orts
Brooks H. Pate
Gregory E. Poirier
Martin E. Poitzsch
Jack L. Robertson
Peter A. Rosenthal
Russell V. Smilgys
Michael R. Winchester

U. of California/Berkeley
U. of Minnesota
Yale U.
U. of California/Santa Barbara
U. of Wisconsin
Cornell U.
California Institute of Technology
Pennsylvania State U.
Cornell U.
U. of California/Santa Barbara
U. of Wisconsin
U. of Toronto, Canada
U. of Texas
Harvard U.
U. of Houston
Stanford U.
U. of Colorado
Clemson U.

Howard R. Baum
Robb M. Thomson
David J. Wineland
William D. Phillips
Kermit C. Smyth
William M. Haynes
Jeffrey W. Hudgens
William F. Egelhoff, Jr.
Sheldon M. Wiederhorn
Ronald G. Rehm
Theodore V. Vorburger
Thomas B. Lucatorto
Wen-Li Wu
Gerald T. Fraser
Stephen Semancik
John J. Bollinger
John J. Rush
Ronald H. Ono
Richard L. Kurtz
Gregory C. Turk

Rensselaer Polytechnic Institute
U. of Michigan
U. of Maryland
Tulane U.
Texas A&M U.
Princeton U.
New York U.
U. of Michigan
Johns Hopkins U.
Boston U.
U. of Colorado
Harvard U.
Harvard U.
State U. of New York/Stony Brook
U. of Colorado
American U.
U. of Massachusetts
Brigham Young U.
U. of Pittsburgh
U. of Virginia
U. of Illinois
Harvard U.
State U. of New York/Stony Brook
Indiana U.
U. of California/Los Angeles
U. of California/Berkeley

Michael R. Zachariah
Gerald T. Fraser
David T. Read
Jeffrey W. Hudgens
Michael J. Welch
Anthony Hamins
Ronald B. Goldfarb
Michael J. Tarlov
Michael H. Kelley
Johanna M. H. Levelt Sengers
David J. Wineland
John M. Martinis
Carol A. Handwerker
Baldwin Robertson
James C. Bergquist
William A. MacCrehan
Charles C. Han
Stephen A. Wise
David J. Nesbitt
Paul D. Lett
David A. Rudman
Geoffrey L. Greene
Herbert S. Bennett
Dominic F. Vecchia
Wen-Li Wu
John C. Stephenson

1993

Levent Acar
David T. Anderson
Philip J. Austin
Amy S. Barton

Ohio State U.
Dartmouth College
U. of Michigan
Princeton U.

James S. Albus
David J. Nesbitt
Takashi Kashiwagi
David J. Wineland

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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:

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. Dibleter
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:

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:

Rosa Award—Judson C. French
1972
Gold Medal Awards—
Ruth M. Davis
Myron G. Domsitz
Jerome Kruger
James R. McNealy
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

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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 Kasuda
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:
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:
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
   Andr. 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

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1989
Gold Medal Awards—
George Bimbaum
Lloyd A. Currie
Harold E. Nelson
Joseph Reader
Emil Simiu
Group:
D. Wayne Hanson, David A. Howe, James L. Jesperson.
Group:
Group:
Stratton Award—
Group
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:

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:

Sources:
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 Consulting engineer in metallurgy, South Bethlehem, Pennsylvania, and secretary, Association of American Steel Manufacturers. 1901-1907

Elihu Thomson Electrical engineer, General Electric Company, Lynn, Massachusetts. 1901-1918

Ira Remsen Director of Chemical Laboratory and President, John Hopkins University. 1901-1909

Henry S. Pritchett President, Massachusetts Institute of Technology; later, President, Carnegie Foundation for the Advancement of Teaching. 1901-1910

Edward L. Nichols Professor of physics, Cornell University. 1901-1911

Robert S. Woodward President, Carnegie Institution of Washington. 1908-1912

Henry M. Howe Professor of metallurgy, Columbia University. 1909-1914

Arthur G. Webster Director, Physics Laboratory, Clark University. 1910-1915

John F. Hayford Director, College of Engineering, Northwestern University. 1912-1921

Arthur E. Kennelly Professor of electrical engineering, Harvard University. 1912-1917
John R. Freeman  
Consulting engineer, Providence, Rhode Island.  
1915-1924; 1926-1931

William A. Noyes  
Director, Chemical Laboratory, University of Illinois.  
1915-1920

Joseph S. Ames  
Director, Physical Laboratory, Johns Hopkins University.  
1917-1922

Wilder D. Bancroft  
Professor of physical chemistry, Cornell University.  
1920-1925

Fred W. McNair  
President, Michigan College of Mines (1921-23).  
1921-1923

Ambrose Swasey  
Chairman of the Board, Warner & Swasey Company, Cleveland, Ohio.  
1921-1926

Samuel W. Stratton  
President, Massachusetts Institute of Technology.  
1923-1931

Gano Dunn  
1923-1948

William F. Durand  
Professor of mechanical engineering, Leland Stanford University.  
1924-1929

Willis R. Whitney  
Director, General Electric Research Laboratory, Schenectady, New York.  
1925-1930

Charles F. Kettering  
Director of Research and Vice President, General Motors Corporation.  
1929-1934; 1947-1952

Charles L. Reese  
Consulting chemist to E.I. du Pont de Nemours & Company.  
1930-1935

Morris E. Leeds  
1931-1941

Karl T. Compton  
President, Massachusetts Institute of Technology.  
1931-1947

William D. Coolidge  
Vice President and Director of Research, General Electric Company.  
1935-1949

Frank B. Jewett  
Vice President for Research & Development, American Telephone & Telegraph Co.; President, National Academy of Sciences.  
1935-1945

Vannevar Bush  
President, Carnegie Institution of Washington; Director, Office of Scientific Research and Development.  
1942-1946
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  
Senior Vice President for Research and Development, Xerox Corporation.  
1969-1974

James C. Fletcher  
President, University of Utah.  
1970-1971

H. Guyford Stever  
President, Carnegie Mellon University.  
1971-1976

Milton Harris  
President, Harris Research Laboratories, Incorporated.  
1971-1973

Arthur M. Bueche  
Vice-President for Research and Development, General Electric Company.  
1971-1975

John G. Truxall  
Dean, College of Engineering, State University of New York at Stony Brook.  
1972-1976

Charles E. Peck  
Vice-President, Construction Group, Owens-Corning Fiberglas Corporation.  
1973-1977

Edwin A. Gee  
Senior Vice President, E.I. du Pont de Nemours & Company; International Paper Corporation.  
1973-1978

Robert H. Dicke  
Professor of physics, Princeton University.  
1974-1979

W. Dale Compton  
Vice-President for Research, Ford Motor Company.  
1975-1981

William D. Carey  
Executive Officer, American Association for the Advancement of Science.  
1976-1981

William K. Linvill  
Department of engineering economics, Stanford University.  
1978-1982

Dorothy M. Simon  
Vice-President for Research, AVCO Corporation.  
1978-1983

Walter H. Stockmayer  
Department of chemistry, Dartmouth College.  
1979-1984

G. King Walters  
Dean, Physics Department, Rice University.  

Russell G. Meyerand, Jr.  
Vice-President for Technology, United Technologies Corporation.  
1980-1985

Bernard M. Oliver  
Vice-President, Hewlett Packard Company.  
1982-1986

Robert H. Pry  
Center for Innovative Technology; Consultant, Gould Incorporated.  
1983-1987
William D. Manly 1984-1989
Senior Vice-President, Cabot Corporation; Consultant, Oak Ridge National Laboratory.

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.

Vice-President, Technical Resources, Science & Technology Department, TRW Incorporated.

Dean, College of Engineering, University of Wisconsin.

Vice-President for Research, Ford Motor Company.

Nolen M. Ellison 1988-1989
President, Cuyahoga Community College.

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.

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.

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.

Vice-President for Applied Research, Bellcore Corporation.
Senior Vice President for Science and Technology, United Technologies Corporation.

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.

President, Raychem Corporation.

George M. Whitesides 1994-1997
Professor of chemistry, Harvard University.

Craig I. Fields 1995-2001
Vice Chairman, Alliance Gaming Corporation.

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, Incorporated.

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.
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.
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)

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... 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.
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. (1973) SP-397 June 1974
NBS Annual Report Fiscal Year 1974. SP-418 March 1975
Science on it's Way to Work, Activities of the National Bureau of Standards...
...[1977] SP-498 April 1978
SP-538 July 1979
1979 was not published.
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.US
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.

918
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.

919
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)

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)
Continued by: Dimensions: the Magazine of the National Bureau of Standards

Dimensions: the Magazine of the National Bureau of Standards
T1.U45
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

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.U5
No. 1-10 (1933-1942)
Continued by: *Hydraulic Research in the United States*

**Hydraulic Research in the United States**
TC1.U5
Vol. 11-14 (1947-1950)

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.
Contributions

Descriptive or measurement techniques.

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 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)

Technologic Papers of the Bureau of Standards
T1.U4
Vol. 1-22 (1910-1928)
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
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
Continues in part: Journal of Research of the National Bureau of Standards
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 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
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.

925
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)  

Letter Circular of the National Institute of Standards and Technology  
QC100.U5775  

Limitation of Variety Recommendations  
No. 1 (September 1, 1924)


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.

926
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

927
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

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

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

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
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.U573
No. 1-1321 (1959-1988)
Continued by: NIST Technical Note
Nos. 1250-1299, 1310, 1318 published as NIST 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.
Continued: 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)

Projects and Publications of the National Applied Mathematics Laboratories: a Quarterly Report
QA27.U5A32
(1947-1954)
Continued: 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)

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
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


One of the first official payrolls of NBS, July 1901.

935
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**

**WEIGHTS AND MEASURES**
Comparison of Capacities
Weights and Measures Assistant

**HEAT AND THERMOMETRY**
Low Temperature Investigations
High Temperature Investigations
Comparison of Thermometers
Heat and Thermometry Assistant

**LIGHT AND OPTICAL INSTRUMENTS**
Spectroscopy
Magneto-Optics
Computer

**ENGINEERING INSTRUMENTS AND MATERIALS**
Engineering Instruments and Materials Assistants

**ELECTRICITY**
Inductance and Capacity
Magnetism and Absolute Measurements of Current
Electrical Measuring Instruments

Photometry
Electrical Resistance and Electromotive Force

Electricity Assistants

Naval Radio Research Laboratory
Army Signal Service Radio Laboratory

**CHEMISTRY**
Chemistry Assistants

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Dr. Samuel W. Stratton
Louis A. Fischer
Roy Y. Ferner
Arthur T. Pienkowski
Dr. Charles W. Waidner
Dr. Charles W. Waidner
Dr. George K. Burgess
Dr. Hobart C. Dickinson
Eugene F. Mueller
Dr. Samuel W. Stratton
Dr. Perley G. Nutting
Frederick J. Bates
Dr. William W. Coblentz
Charles F. Sponsler
Albert S. Merrill
Oscar G. Lange
Dr. Edward B. Rosa
Dr. Edward B. Rosa
Dr. Frederick W. Grover
Dr. Karl E. Guthe
Herbert B. Brooks
Dr. Morton G. Lloyd
Clarence E. Reid
Dr. Edward P. Hyde
Dr. Frank A. Wolff
Dr. George W. Middlekauff
Francis E. Cady
Franklin S. Durston
Dr. N. Ernest Dorsey
Maynard P. Shoemaker
Dr. Louis W. Austin
E.R. Cramm

Dr. William A. Noyes
Dr. Henry N. Stokes
Dr. John R. Cain
Campbell E. Waters

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936
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**
Technical Assistant to the Director

**I. ELECTRICAL**
- Standards of Resistance
- Inductance and Capacity
- Electrical Measuring Instruments
- Magnetic Measurements
- Photometry and Illuminating Engineering
- Radio Research and Testing
- Radio Development
- Electrolysis Prevention
- Safety Engineering
- Gas Engineering
- Electrical Service Standards
- Telephone Service Standards
- Electrochemistry
- Radioactivity and X-ray Measurements

**II. WEIGHTS AND MEASURES**
- Length
- Mass
- Time
- Capacity and Density
- Gas Measuring Instruments
- Thermal Expansivity
- Weights and Measures Laws and Administration
- Investigation and Testing of Scales
- Gages

**III. HEAT AND THERMOMETRY**
- Thermometry
- Pyrometry
- Heat Measurements
- Thermodynamics
- Cryogenic Laboratory
- Fire Resistance
- Airplane and Automotive Power Plant

**IV. LIGHT AND OPTICAL INSTRUMENTS**
- Spectroscopy
- Polarimetry
- Colorimetry
- Refractometry and Optical Instruments
- Radiometry
- Dispersoids
- Photographic Technology
- Interferometry
- Searchlight Investigations
V. Chemistry
Physical Chemistry
Electrochemistry
Metallurgical Chemistry
Gas Chemistry
Reagents and Apparatus
Analytical Methods, Standard Samples
Oils, Rubber, Paper, etc.
Metals, Cement, Bituminous Materials
Paint, Varnish, Soap

VI. Engineering Physics
Mechanical Appliances
Engineering Instruments
Aviation Instruments
Aviation Physics
Special Investigations (Sound)

VII. Engineering, Structural, and Miscellaneous Materials
Metal Structures
Cement, Sand, Stone, etc.
Rubber, Leather, etc.
Textiles
Paper
Lubricating Oils
Lime, Gypsum, Sand, Brick

VIII. Metallurgy
Microscopy of Metals
Heat Treatment and Thermal Analysis
Physical Properties of Metals
Chemical Metallurgy
Foundry and Mechanical Plant

IX. Ceramics
Clay Products
Optical Glass
Refractories
Enamed Metal Products

X. Miscellaneous (Sound)

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
Assistant Director for Research and Testing
Assistant Director for Commercial Standardization

I. Electrical
Resistance Measurements
Inductance and Capacitance
Electrical Instruments

Dr. William F. Hillebrand
Dr. Cyril S. Taylor
Dr. William Blum
Dr. John R. Cain
Elmer R. Weaver
Frederick W. Smither
Dr. Gustave E.F. Lundell
Campbell E. Waters
Samuel S. Voorhees
Dr. Percy H. Walker
Dr. Samuel W. Stratton
Philip L. Wormeley
Walter F. Stutz
Dr. Mayo D. Hersey
Dr. Lyman J. Briggs
John F. Hayford
Dr. George K. Burgess
Herbert L. Whitemore
Joseph C. Pearson
Philip L. Wormeley
Frank R. McGowan
Frederick A. Curtis
Dr. Winslow H. Herschel
Warren E. Emley
Dr. Albert V. Bleininger
Dr. Albert V. Bleininger
William H. Taylor
Homer F. Staley
Homer F. Staley
Dr. Englehardt A. Eckhardt
Magnetic Measurements
Photometry
Radio
Underground Corrosion
Safety Standards
Electrochemistry
Telephone Standards

II. WEIGHTS AND MEASURES
Length
Mass
Time
Capacity and Density
Gas Measuring Instruments
Thermal Expansivity
Weights and Measures Laws and Administration
Railroad Scales and Test Cars
Gages

III. HEAT AND POWER
Thermometry
Pyrometry
Heat Measurements
Heat Transfer
Cryogenic Laboratory
Fire Resistance
Automotive Power Plant
Friction and Lubrication

IV. OPTICS
Spectroscopy
Polarimetry
Colorimetry
Optical Instruments
Radiometry
Atomic Physics, Radium, X-Rays
Photographic Technology
Interferometry

V. CHEMISTRY
Physico-Chemical Research
Paints, Varnish, Bituminous Materials
Detergents, Cement, Corrosion
Rubber, Lubricants, Textiles
Metal and Ore Analysis, Standard Samples
Reagents and Platinum Metals
Electrochemistry
Gas Chemistry

Raymond L. Sanford
Dr. J. Franklin Meyer
Dr. J. Howard Dellinger
Kirk H. Logan
Dr. Morton G. Lloyd
Dr. George W. Vinal
Dr. Frank A. Wolff

Fay S. Holbrook and
Henry W. Bearce
Dr. Lewis V. Judson
Dr. Arthur T. Pienkowsky
Ralph E. Gould
Elmer L. Peffer
Howard S. Bean
Dr. Wilmer Souder
Ralph W. Smith
Fay S. Holbrook
David R. Miller

Dr. Hobart C. Dickinson
Johanna Busse
Dr. Henry T. Wensel
Eugene F. Mueller
Dr. Milton S. VanDusen
Dr. Ferdinand G. Brickwedde
Simon H. Ingberg
Herbert K. Cummings
Dr. Mayo D. Hersey

Dr. Clarence A. Skinner
Dr. William F. Meggers
Frederick J. Bates
Irwin G. Priest
Dr. Irvine C. Gardner
Dr. William W. Coblentz
Dr. Fred L. Mohler
Raymond Davis
Chauncey G. Peters

Dr. Edward W. Washburn
Dr. Edward W. Washburn
Dr. Percy H. Walker
Frederick W. Smither
Campbell E. Waters
Dr. Gustave E. F. Lundell
Dr. Edward Wichers
Dr. William Blum
Elmer R. Weaver
VI. MECHANICS AND SOUND
Engineering Instruments and Mechanical Appliances
Sound
Aeronautic Instruments
Aerodynamic Physics
Engineering Mechanics
Hydraulic Laboratory

VII. ORGANIC AND FIBROUS MATERIALS
Rubber
Textiles
Paper
Leather

VIII. METALLURGY
Optical Metallurgy
Thermal Metallurgy
Mechanical Metallurgy
Chemical Metallurgy
Experimental Foundry

IX. CLAY AND SILICATE PRODUCTS
Whiteware
Glass
Refractories
Enamels
Heavy Clay Products
Cement and Concrete Materials
Masonry Construction
Lime and Gypsum
Stone

X. SIMPLIFIED PRACTICE
Stone, Clay, and Glass
Wood, Textiles, and Paper
Metal Products and Construction Materials
Containers
Promotion and Adherence

XI. BUILDING AND HOUSING
Building Codes
Building Practice and Homebuilders' Problems
City Planning and Zoning
Construction Economics
Mechanics Liens

XII. SPECIFICATIONS
Certification: Producer Contacts
Labeling: Consumer Contacts
Directory of Specifications
Encyclopedia of Specifications

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XIII. Trade Standards
Wood Products, Paper, Rubber, etc.
Metal Products
Textiles and Garments
Ceramic Products and Cement

Ihler J. Fairchild
Harry H. Steidle
Ihler J. Fairchild
Ihler J. Fairchild
George W. Wray

***

By May 1, 1940, dental research and field stations had become part of the NBS technical program.

MAY 1, 1940

**DIRECTOR**
Assistant to the Director
Assistant Director for Research and Testing
Assistant Director for Commercial Standardization

**I. ELECTRICITY**
Resistance Measurements
Inductance and Capacitance
Electrical Instruments
Magnetic Measurements
Photometry
Radio
Underground Corrosion
Electrochemistry
Telephone Standards

Dr. Lyman J. Briggs
Dr. Eugene C. Crittendon
Dr. Addams S. McAllister

Dr. Frank Wenner
Dr. Harvey L. Curtis
Dr. Francis B. Silsbee
Raymond L. Sanford
Dr. J. Franklin Meyer
Dr. J. Howard Dellinger
Kirk H. Logan
Dr. George W. Vinal
Dr. Frank A. Wolff

Henry W. Bearce
Dr. Lewis V. Judson
Dr. Arthur T. Pienkowsky
Ralph E. Gould
Elmer L. Peffer
Howard S. Bean
Dr. Wilmer Souder
Ralph W. Smith
Ralph W. Smith
David R. Miller

**II. WEIGHTS AND MEASURES**
Length
Mass
Time
Capacity and Density
Gas Measuring Instruments
Thermal Expansion, Dental Research
Weights and Measures Laws and Administration
Large-Capacity Scales
Gages

Dr. Hobart C. Dickinson
Johanna Busse
Dr. Henry T. Wensel
Eugene F. Mueller
Dr. Milton S. VanDusen
Dr. Ferdinand G. Brickwedde
Simon H. Ingberg
Herbert K. Cummings
Dr. Oscar C. Bridgeman
Melville F. Peters
IV. OPTICS
Spectroscopy
Polarimetry
Colorimetry and Spectrophotometry
Optical Instruments
Radiometry
Atomic Physics, Radium, X-Rays
Photographic Technology
Interferometry Chauncey

V. CHEMISTRY
Paints, Varnishes, etc.
Detergents, Cement, etc.
Organic Chemistry
Metal and Ore Analysis, Standard Samples
Reagents and Platinum Metals
Electrochemistry (Plating)
Gas Chemistry
Physical Chemistry
Thermochemistry and Constitution of Petroleum

VI. MECHANICS AND SOUND
Engineering Instruments
Sound
Aeronautical Instruments
Aerodynamic Physics
Engineering Mechanics
Hydraulics

VII. ORGANIC AND FIBROUS MATERIALS
Rubber
Textiles
Paper
Leather
Testing and Specifications
Fiber Structure
Organic Plastics

VIII. METALLURGY
Optical Metallurgy
Thermal Metallurgy
Mechanical Metallurgy
Chemical Metallurgy
Experimental Foundry

Dr. Clarence A. Skinner
Dr. William F. Meggers
Frederick J. Bates
Dr. Kasson S. Gibson
Dr. Irvine C. Gardner
Dr. William W. Coblentz
Dr. Fred L. Mohler
Raymond Davis
G. Peters

Dr. Gustave E.F. Lundell
Eugene F. Hickson
Frederick W. Smither
Campbell C. Waters
Harry A. Bright
Dr. Edward Wichers
Dr. William Blum
Elmer R. Weaver
Dr. Edgar R. Smith
Dr. Frederick D. Rossini

Dr. Hugh L. Dryden
Walter F. Stutz
Dr. Paul R. Heyl
Dr. William G. Brombacher
Dr. Hugh L. Dryden
Herbert L. Whittemore
Herben N. Eaton

Warren E. Emley
Dr. Archibald T. McPherson
William D. Appel
Bourdon W. Scribner
Roy C. Bowker
Philip L. Worneley
Dr. Solomon F. Acree
Dr. Gordon M. Klime

Dr. Henry S. Rawdon
Dr. Henry S. Rawdon
Dr. Dunlop J. McAdam, Jr.
William H. Swanger
Dr. John G. Thompson
Charles M. Saeger, Jr.
IX. Clay and Silicate Products
   Whiteware
   Glass
   Refractories
   Enamelled Metals
   Heavy Clay Products
   Cement and Concrete Materials
   Masonry Construction
   Lime and Gypsum
   Stone

   Phaon H. Bates
   Roman F. Geller
   Alfred N. Finn
   Raymond A. Heindl
   William N. Harrison
   Ray T. Stull
   John Tucker, Jr.
   Douglas E. Parsons
   Dr. Lansing S. Wells
   Daniel W. Kessler

X. Simplified Practice
   Wood, Textiles, and Paper
   Metal Products and Construction Materials
   Containers and Miscellaneous Products
   Materials Handling Equipment and Ceramics

   Edwin W. Ely
   George Schuster
   George Schuster
   William E. Braithwaite
   Edwin W. Ely

XI. Trade Standards
   Wood, Wood Products, etc.
   Metal Products
   Textiles
   Apparel
   Petroleum, Chemicals, Rubber
   Export Standards

   Ihler J. Fairchild
   James W. Medley
   Ihler J. Fairchild
   Herbert A. Ehrman
   Lovic R. Gilbert
   Floyd W. Reynolds
   Milton E. Countryman

XII. Codes and Specifications
   Safety Codes
   Building Codes
   Building Practice and Specifications
   Producer Contracts and Certification
   Consumer Contracts and Labeling

   Dr. Addams S. McAllister
   Dr. Morton G. Lloyd
   George N. Thompson
   Vincent B. Phelan
   George W. Wray
   Robert A. Martino

Field Stations
   Allentown, Pa. (Cement and Concrete Materials)
   Riverside, Calif. (Cement and Concrete Materials)
   San Francisco, Calif. (Cement and Concrete Materials)
   Denver, Col. (Cement and Concrete Materials)
   Seattle, Wash. (Cement and Concrete Materials)
   Clearing, Ill. (Large-capacity Scale Testing)
   San Jose, Calif. (Cement and Concrete Materials)
   Beltsville, Md. (Radio Transmitting Station)
   Meadows, Md. (Radio Sending Station)

   William N. Moyer
   Donald N. Evans
   I. Furlong
   Orson H. Cox
   Elmer T. Carlson
   C. L. Richard
   Bruce E. Foster
   William D. George
   Samuel S. Kirby
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
Assistant to the Director
Assistant to the Director
Associate Director
Associate Director

**OFFICE OF SCIENTIFIC PUBLICATIONS**

1. Library
2. Technical Reports
3. Publications

**OFFICE OF WEIGHTS AND MEASURES**

Assistant Chief

1. **ELECTRICITY AND OPTICS**
   
   Assistant Chief
   
   1. Resistance Measurements
   2. Inductance and Capacitance
   3. Electrical Instruments
   4. Magnetic Measurements
   5. Photometry and Colorimetry
   6. Optical Instruments
   7. Photographic Technology
   8. Electrochemistry

2. **METROLOGY**
   
   Assistant Chief
   
   1. Length
   2. Mass
   3. Time
   4. Capacity, Density and Fluid Meters
   5. Thermal Expansion
   6. Dental Materials
   7. Scales
   8. Gages

3. **HEAT AND POWER**
   
   1. Temperature Measurements
   2. Thermodynamics
   3. Cryogenics
   4. Engines and Lubrication
   5. Engine Fuels
   6. Combustion

By March 1, 1950, the demands on NBS of World War II and the introduction of computers were evident in the Bureau structure.
4 ATOMIC AND RADIATION PHYSICS
Assistant Chief
Radioactivity Consultant
Stable Tracers Consultant
4A Atomic Physics Laboratory
.1 Spectroscopy
.2 Radiometry
.3 Mass Spectrometry
.4 Physical Electronics
.5 Electron Physics
.6 Atomic Physics
.7 Neutron Measurements
4R Radiation Physics Laboratory
.8 Nuclear Physics
.9 Radioactivity
.10 X-Rays
.11 Betatron
.12 Nucleonic Instrumentation
.13 Radiological Equipment
5 CHEMISTRY
Assistant Chief
.1 Paint, Varnish and Lacquer
.2 Surface Chemistry
.3 Organic Chemistry
.4 Analytical Chemistry
.5 Platinum Metals and Pure Substances
.6 Electrodeposition
.7 Gas Chemistry
.8 Physical Chemistry
.9 Thermochemistry and Hydrocarbons
.10 Spectrochemistry
6 MECHANICS
.1 Sound
.2 Mechanical Instruments
.3 Aerodynamics
.4 Engineering Mechanics
.5 Hydraulics
7 ORGANIC AND FIBROUS MATERIALS
Assistant Chief
Consultant
.1 Rubber
.2 Textiles
.3 Paper
.4 Leather
.5 Testing and Specifications
.7 Organic Plastics
8 METALLURGY
Assistant Chief
.1 Optical Metallurgy
.2 Thermal Metallurgy
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<td>.9 Missile Dynamics</td>
<td>Dr. Harold K. Skramstad</td>
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<td>.10 Missile Intelligence</td>
<td>Dr. Fred S. Atchison</td>
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<td>.11 Missile Engineering</td>
<td>Ralph A. Lamm</td>
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<td>.12 Missile Instrumentation</td>
<td>William A. Wildhack</td>
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<td>.13 Technical Services</td>
<td>James D. McLean (Acting)</td>
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<tr>
<th>Central Radio Propagation Laboratory</th>
<th>Dr. Newbern Smith</th>
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<tr>
<td>Assistant Chief</td>
<td>Alvin G. McNish</td>
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<tr>
<td>Assistant Chief</td>
<td>Kenneth A. Norton</td>
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<tr>
<td>Microwave Research Consultant</td>
<td>Dr. Thomas J. Carroll, Jr.</td>
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<th>Ionospheric Research Laboratory</th>
<th>Alvin G. McNish</th>
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<tr>
<td>.1 Upper Atmosphere Research</td>
<td>Ross Bateman</td>
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<td>.5 Ionospheric Research</td>
<td>Henry P. Hutchinson</td>
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<td>Kenneth A. Norton</td>
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<td>.8 High Frequency Standards</td>
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<th>Budget and Management</th>
<th>Herbert E. Weifenbach</th>
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<td>.1 Budget</td>
<td>Edward E. Upperman</td>
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<td>.3 Procurement</td>
<td>Charles B. Kipps</td>
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<td>.4 Property Management</td>
<td>George B. Kefover</td>
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<td>.5 Records and Communications</td>
<td>Robert W. Lamberson</td>
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<tr>
<td>.6 Accounting</td>
<td>Clinton G. Hall</td>
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<td>.7 Special Services</td>
<td>Frank D. Moncure (Acting)</td>
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<tr>
<th>Personnel</th>
<th>Raymond L. Randall</th>
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<tr>
<td>Assistant Chief</td>
<td>William C. Fewell</td>
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<tr>
<td>.1 Recruitment and Placement</td>
<td>Raymond L. Randall</td>
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<tr>
<td>.2 Operations</td>
<td>Jessie B. Berkley</td>
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<tr>
<td>.3 Classification</td>
<td>Lawrence L. Epperson</td>
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<td>.4 Medical Office</td>
<td>Dr. William Frank</td>
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<td>.5 Education and Training</td>
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<th>Plant</th>
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<td>.1 Power Plant</td>
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<td>.2 Electrical Shop</td>
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<td>.3 Piping Shop</td>
<td>Raymond A. Watson</td>
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<td>.4 Carpenter Shop</td>
<td>Paul J. Robinson</td>
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<tr>
<td>.5 Paint Shop</td>
<td>Raymond E. Mothershead</td>
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<td>.6 General Service</td>
<td>Frank A. Peters</td>
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<tr>
<td>.7 Garage</td>
<td>Harry C. Magnruder</td>
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<tr>
<td>.8 Guard</td>
<td>Herman B. Burke</td>
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<tr>
<td>.9 Grounds</td>
<td>William R. David</td>
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<td>.10 Janitorial</td>
<td>Adeeb J. Neam</td>
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<tr>
<td>.11 Refrigeration and Air Conditioning</td>
<td>Erlidge G. Burke</td>
</tr>
<tr>
<td>.12 Administrative and Engineering Office</td>
<td>(Vacant)</td>
</tr>
</tbody>
</table>
S \textbf{SHOPS}

| Assistant Chief | Paul S. Ballif |
| Shop Superintendent | Winfield L. Drissel |
| .1 Design and Drafting | John L. Hutton |
| .2 Instrument Shop No. 1 | Richard J. Hanrahan |
| .3 Instrument Shop No. 2 | Henry N. Philo |
| .4 Instrument Shop No. 3 | George A. Rheinbold |
| .5 Instrument Shop No. 4 | George W. Bicking, Jr. |
| .6 Instrument Shop No. 5 | Charles W. Hyder |
| .7 Welding and Sheet Metal Shop | Andrew J. Altman |
| .8 Woodworking Shop | Edward G. Clark |
| .9 Shop Tools | Paul D. Huntley |
| .10 Maintenance | Lewis H. Brigham |
| .11 Glassblowing Shop | Winfield L. Drissel |
| .12 Metals Storeroom | Leonardo Testa |
| | James E. Mallory |

\textbf{FIELD STATIONS}

1 \textbf{ELECTRICITY AND OPTICS}
Lamp Inspector, Brookline, MA
George Schnitzler

2 \textbf{METROLOGY}
Master Scale Depot, Clearing, IL
H. Haig Russell, Chief

9 \textbf{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 \textbf{APPLIED MATHEMATICS}
Institute for Numerical Analysis, University of California at Los Angeles, Los Angeles, CA
Dr. J. Berkley Rosser (Acting) Chief

13 \textbf{ELECTRONICS}
Blossom Point Proving Ground, La Plata, MD
Adrian P. Sutton, Chief
Warren Grove Test Field, Warren Grove, Tuckerton, NJ
William A. Wildhack, Chief

948
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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<tr>
<th><strong>DIRECTOR’S OFFICE</strong></th>
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<tbody>
<tr>
<td>Director</td>
<td>Dr. Allen V. Astin</td>
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<tr>
<td>Associate Director for Chemistry</td>
<td>Dr. Wallace R. Brode</td>
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<tr>
<td>Associate Director for Physics</td>
<td>Dr. Robert D. Huntoon</td>
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<tr>
<td>Associate Director for Testing</td>
<td>Dr. Archibald T. McPherson</td>
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<tr>
<td>Associate Director for Administration</td>
<td>Nicholas E. Golovin</td>
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<tr>
<td>Director, Boulder Laboratories</td>
<td>Dr. Frederick W. Brown (Boulder)</td>
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<tr>
<td>Consultant to the Director</td>
<td>Dr. Eugene C. Crittenden</td>
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<tr>
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<td>Dr. Robert D. Huntoon</td>
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<td>Program Records Officer</td>
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<td><strong>OFFICE OF BASIC INSTRUMENTATION</strong></td>
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<tr>
<td>Assistant to the Chief</td>
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<td>.1 Resistance and Reactance</td>
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<td>Dr. Paul J. Selgin</td>
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<td>Raymond Davis</td>
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<td>.4 Length</td>
<td>Dr. Lewis V. Judson</td>
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<td>.5 Engineering Metrology</td>
<td>Irvin H. Fullmer</td>
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HEAT AND POWER

1. Temperature Measurements
2. Thermodynamics
3. Cryogenics
4. Engines and Lubrication
5. Engine Fuels

ATOMIC AND RADIATION PHYSICS

4A Atomic Physics Laboratory

1. Spectroscopy
2. Radiometry
3. Mass Spectrometry
4. Solid State Physics
5. Electron Physics
6. Atomic Physics

4R Radiation Physics Laboratory

8. Nuclear Physics
9. Radioactivity
10. X-Rays
11. Betatron
12. Nucleonic Instrumentation
13. Radiological Equipment
14. Radiation Instruments Branch,
    Atomic Energy Commission

CHEMISTRY

Assistant Chief

1. Organic Coatings
2. Surface Chemistry
3. Organic Chemistry
4. Analytical Chemistry
5. Inorganic Chemistry
6. Electrodeposition
7. Gas Chemistry
8. Physical Chemistry
9. Thermochemistry
10. Spectrochemistry
11. Pure Substances

MECHANICS

Consultant

1. Sound
2. Mechanical Instruments
3. Fluid Mechanics
4. Engineering Mechanics
5. Mass and Scale
6. Capacity, Density and Fluid Meters
7. Combustion Controls

Dr. Ferdinand G. Brickwedde
Dr. Ferdinand G. Brickwedde (Acting)
Dr. Charles W. Beckett
Dr. Ralph P. Hudson (Acting)
James F. Swindells (Acting)
Dr. Frank L. Howard
Dr. Lauriston S. Taylor
Dr. William F. Meggers
Dr. Earle K. Plyler
Dr. Fred L. Mohler
Dr. Robert G. Breckenridge
Dr. Ladislaus L. Marton
Dr. Lewis M. Branscomb (Acting)
Dr. Harold O. Wyckoff
Dr. Ugo Fano
Dr. Wilfrid B. Mann
Dr. Harold O. Wyckoff
Dr. Herman W. Koch
Louis Costrell
Dr. Scott W. Smith
Dr. Edward Wichers
Dr. James I. Hoffman
Paul T. Howard
Dr. James I. Hoffman
W. Harold Smith
Harry A. Bright
Dr. Raleigh Gilchrist
Dr. Abner Brenner
Elmer R. Weaver
Dr. Edgar R. Smith
Edward J. Prosen
Bourdon F. Scribner
Dr. Charles P. Saylor
Dr. Walter Ramberg
Dr. Wilmer Souder
Dr. Richard K. Cook
Edward C. Lloyd
Dr. Galen B. Schubauer
Bruce L. Wilson
Douglas R. Tate
Howard S. Bean
Dr. Ernest F. Fiocck
7 ORGANIC AND FIBROUS MATERIALS
  Assistant Chief
  .1 Rubber
  .2 Textiles
  .3 Paper
  .4 Leather
  .5 Testing and Specifications
  .6 Polymer Structure
  .7 Organic Plastics
  .8 Dental Research
  Dr. Gordon M. Kline
  William D. Appel
  Dr. Lawrence A. Wood
  William D. Appel
  Dr. Robert B. Hobbs
  Everett L. Wallace
  Dr. Robert D. Stehler
  Dr. Norman P. Bekkedahl
  Frank W. Reinhart
  William T. Sweeney

8 METALLURGY
  .1 Thermal Metallurgy
  .2 Chemical Metallurgy
  .3 Mechanical Metallurgy
  .4 Corrosion
  Dr. John G. Thompson
  Thomas G. Digges
  Leroy L. Wyman
  John A. Bennett
  George A. Ellinger

9 MINERAL PRODUCTS
  Assistant Chief
  .1 Porcelain and Pottery
  .2 Glass
  .3 Refractories
  .4 Enameled Metals
  .5 Concreting Materials
  .6 Constitution and Microstructure
  Dr. Irl C. Schoonover
  Clarence H. Hahner
  Roman F. Geller
  Clarence H. Hahner
  Raymond A. Heindl
  William N. Harrison
  Raymond L. Blaine
  Howard F. McMurdie

10 BUILDING TECHNOLOGY
  Assistant Chief
  Consultant
  Consultant
  .1 Structural Engineering
  .2 Fire Protection
  .3 Heating and Air Conditioning
  .4 Floor, Roof and Wall Coverings
  .5 Codes and Specifications
  Douglas E. Parsons
  George N. Thompson
  William F. Roeser
  John W. McBumey
  Douglas E. Parsons
  Dr. Alexander F. Robertson
  Richard S. Dill
  Dr. Hubert R. Snoke
  George N. Thompson

11 APPLIED MATHEMATICS
  Assistant Chief
  .1 Numerical Analysis
  .2 Computation
  .3 Statistical Engineering
  .4 Machine Development
  Dr. Franz L. Alt (Acting)
  Dr. Edward W. Cannon
  John Todd
  Dr. Milton Abramowithz (Acting)
  Dr. Churchill Eisenhart
  Dr. Edward W. Cannon

12 DATA PROCESSING SYSTEMS
  Assistant Chief for Systems
  .1 Components and Techniques
  .2 Digital Circuitry
  .3 Digital Systems
  .4 Analog Systems
  Samuel N. Alexander
  Dr. Harold K. Skramstad
  Arthur W. Holt
  Robert D. Elbourn
  Alan L. Leiner
  Dr. Harold K. Skramstad (Acting)
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<td>Accounts and Reports</td>
<td>Gordon D. Horsburgh, Willard K. Duckworth, Margaret L. Spiess, Pearl E. Miller, John P. Lafon, Matilda Udoff, Doris J. Lothrop, Kathryn L. Rock</td>
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<td>ADMINISTRATIVE SERVICES</td>
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<td>Paul McClendon</td>
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**Boulder Laboratories***

**Director**
- Administration
  - Washington Liaison Office
  - Personnel
  - General Services
  - Engineering Services

**Cryogenic Engineering***
- Cryogenic Equipment
- Cryogenic Processes
- Properties of Materials
- Gas Liquefaction

**Radio Propagation Physics***
- Upper Atmosphere Research
- Ionospheric Research
- Regular Propagation Services

**Radio Propagation Engineering***
- Frequency Utilization Research
- Tropospheric Propagation Research

**Radio Standards***
- Assistant Chief for Research
  - High Frequency Standards Branch
    - High Frequency Electrical Standards
    - Radio Broadcast Service
    - HF Impedance Standard
  - Microwave Standards Branch
    - Extreme High-Frequency and Noise
    - Microwave Frequency and Spectroscopy
    - Microwave Circuit Standard

*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-I, 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
Deputy Director
Assistant to the Director
Assistant to the Director
Assistant to the Director, Automatic Data Processing
Senior Research Fellow
Senior Research Fellow
Senior Research Fellow

101 OFFICE OF THE DIRECTOR
Dr. Allen V. Astin
Dr. Irl C. Schoonover
George E. Auman
Clarence N. Coates
W. Howard Gammon
Dr. Churchill Eisenhart
Dr. Ugo Fano
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
Patent Advisor
Robert S. Walleigh
David Robbins

121 ACCOUNTING
Deputy Chief
.01 Reports and Billing
.02 Classification
.03 Tabulation
.04 Voucher Examination
.05 Payroll
Jacob Seidenberg
Homer McIntyre
Pearl E. Miller
Edgar H. MacArthur
Frederick I. Baum (Acting)
Matilda Udoff
Kathryn L. Rock

122 ADMINISTRATIVE SERVICES
Assistant Chief
.01 Records and Communications
.02 Special Services
.03 Janitorial Services
.04 Guard Services
.05 Transportation Services
.06 Security Office
Harry P. Dalzell
Karl L. Hafen
Howard L. Sampson
Walter J. Rabitt
Robert C. Howey
Capt. William J. Kane
Charles W. Anderson
Harry P. Dalzell

123 BUDGET AND MANAGEMENT
.01 Budget
.02 Management Analysis
Dr. James E. Skillington, Jr.
Eugene C. Denne
John B. Tallerico

124 INTERNAL AUDIT
Harold F. Whittington
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<th>ASSOCIATE DIRECTOR FOR TECHNICAL SUPPORT</th>
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INSTRUMENT SHOPS
Assistant Chief
.01 Instrument Shop #1
.02 Instrument Shop #2
.03 Instrument Shop #3
.04 Instrument Shop #4
.05 Instrument Shop #5
.06 Glassblowing
.07 Welding and Sheet Metal Shop
.08 Optical Shop
.09 Tool Crib

Frank P. Brown
Winfield L. Drissel
John R. Hettenhouser
Walter A. Koepper
Charles E. Taylor
Philip Pfaff, Jr.
Philip Pfaff, Jr.
Enrico Deleonibus
Harold E. Brown
Stanley W. Gerner
Lewis H. Brigham

MANAGER, BOULDER LABORATORIES
Office of the Manager, Boulder Laboratories
Manager
Consultant—Statistics
Consultant—Math Group and Computation Facility
Consultant—Mathematical Physics

Russell B. Scott
Dr. Edwin L. Crow
Dr. John J. Sopka
H. E. Brown

Administrative, Boulder Laboratories
.01 Consultant—Engineering
.10 Management Planning
.20 Personnel
.30 Fiscal
.40 Supply
.50 Office Services
.60 Plant Engineering
.70 Shops

Samuel W. J. Welch
Paul S. Ballif
J. Berkley
Roy W. Stockwell
Herbert D. Stansell
Barton F. Betts
Richard G. Bulgin
Edgar A. Yuzwiak
John L. Hutton

INSTITUTE FOR BASIC STANDARDS
Director
Associate Director, Measurement Services

Dr. Robert D. Huntoon
William A. Wildhack

Office of Standard Reference Data
Thermodynamics and Transport Data
Chemical Kinetics
Information Systems

Dr. Edward L. Brady
Dr. Everett R. Johnson
Dr. Stephen A. Rossnasser
Dr. Franz L. Alt

APPLIED MATHEMATICS
Consultant
Consultant
Consultant
.01 Numerical Analysis
.02 Computation
.03 Statistical Engineering
.04 Mathematical Physics
.05 Operations Research

Dr. Edward W. Cannon
Dr. Hansjorg Oser
Ida Rhodes
Dr. William J. Youden
Dr. Morris Newman
Dr. Don I. Mittleman
Joseph M. Cameron
Dr. William H. Pell
Dr. Alan J. Goldman
### 211 ELECTRICITY

- **.01** Resistance and Reactance
- **.02** Electrochemistry
- **.03** Electrical Instruments
- **.04** Magnetic Measurements
- **.05** Dielectrics
- **.06** High Voltage
- **.07** Absolute Electrical Measurements

- Dr. Chester H. Page
- Chester Peterson
- Dr. Walter J. Hamer
- Francis L. Hermach
- Irvin L. Cooter
- Dr. Arnold H. Scott
- Dr. F. Ralph Kotter
- Dr. Forest K. Harris

### 212 METROLOGY

**Assistant Chief**

- **.11** Photometry and Colorimetry
- **.12** Refractometry
- **.13** Photographic Research
- **.21** Length
- **.22** Engineering Metrology
- **.31** Mass and Volume

- Alvin G. McNish
- Dr. Deane B. Judd
- Louis E. Barbrow
- Dr. Francis E. Washer
- Calvin S. McCamy
- Theodore R. Young
- Irvin H. Fullmer
- Paul E. Pontius

### 213 MECHANICS

**Consultant**

- **.01** Sound
- **.02** Pressure and Vacuum
- **.03** Fluid Mechanics
- **.04** Engineering Mechanics
- **.05** Rheology
- **.06** Combustion Controls

- Bruce L. Wilson
- Dr. John M. Frankland
- Edward C. Lloyd
- Dr. Richard K. Cook
- Dr. Daniel P. Johnson
- Dr. Galen B. Schubauer
- Lafayette K. Irwin
- Dr. Robert S. Marvin
- Frank R. Caldwell
- Dr. Ralph P. Hudson
- Dr. Charles W. Beckett
- James F. Swindells
- Dr. Defoe C. Ginnings
- Dr. Ernest Ambler
- Joseph Hilsenrath
- Dr. Melville S. Green

### 221 HEAT

**Assistant Chief, Thermodynamics**

- **.01** Temperature Physics
- **.02** Heat Measurements
- **.03** Cryogenic Physics
- **.04** Equation of State
- **.05** Statistical Physics

- Dr. Karl G. Kessler
- Dr. William C. Martin, Jr.
- Dr. David R. Lide, Jr.
- Dr. Robert P. Madden
- Dr. Hans P. R. Frederikse
- Dr. John A. Simpson
- Dr. Harold S. Boyne
- Dr. Wolfgang L. Wiese

- Dr. Merril B. Wallenstein
- Dr. William L. Clinton
- Edward J. Prosen
- Dr. Ransom B. Parlin
- Dr. Morris Krauss
- Donald D. Wagman
- Dr. Ralph Klein
- Dr. Horace S. Isbell
- Dr. David E. Mann
- Dr. Robert E. Fergson
- Dr. Harry M. Rosenstock
- Dr. James R. McNesby
*224 LABORATORY ASTROPHYSICS

231 RADIATION PHYSICS
   .01 Radiation Theory

RADIOLOGICAL PHYSICS BRANCH
   .11 X-ray Physics
   .12 Dosimetry
   .13 X-ray Standards

NUCLEAR PHYSICS BRANCH
   .21 Radioactivity
   .22 Neutron Physics
   .23 Photonuclear Physics
   .24 Nuclear Spectroscopy

Accelerator Branch
   .31 Accelerator Engineering
   .32 Radiation Physics Instrumentation
   .33 Accelerator Physics

*250 RADIO STANDARDS LABORATORY
   Scientific Consultant

*251 RADIO STANDARDS PHYSICS
   Assistant Chief
   Consultant
   .01 Frequency-Time Dissemination Research
   .02 Frequency-Time Broadcast Services
   .03 Radio and Microwave Materials
   .04 Atomic Frequency and Time Interval Standards
   .06 Radio Plasma
   .07 Microwave Physics

*252 RADIO STANDARDS ENGINEERING
   Consultant
   Consultant
   .11 Low Frequency Calibration Services
   .21 HF Calibration Services
   .22 HF Electrical Standards
   .23 HF Impedance Standards
   .31 Microwave Calibration Services
   .32 Microwave Circuit Standards

300 INSTITUTE FOR MATERIALS RESEARCH
   Director
   Deputy Director

302 OFFICE OF STANDARD REFERENCE MATERIALS
   Dr. W. Wayne Meinke
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<th>310</th>
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<td>Dr. Samuel G. Weissberg</td>
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423 INFORMATION TECHNOLOGY
   PILOT
   .01 Components and Techniques
   .02 Computer Technology
   .03 Measurements Automation
   .04 Engineering Applications
   .05 Systems Analysis

424 PERFORMANCE TEST DEVELOPMENT

425 INSTRUMENTATION
   .01 Engineering Electronics
   .02 Electron Devices
   .03 Electronic Instrumentation
   .04 Mechanical Instruments
   .05 Basic Instrumentation

426 TRANSPORT SYSTEMS

427 TEXTILES AND APPAREL TECHNOLOGY CENTER
   Consultant
   Mathematician
   Industrial Specialist
   Consultant
   Consultant
   .01 Contract Research Program
   .02 Technical Support Program

*500 CENTRAL RADIO PROPAGATION LABORATORY
   Director
   Deputy Director
   Senior Research Fellow
   Consultant
   Consultant
   Consultant
   CRPL Liaison and Program Development
   Consultant Radio Wave Propagation

*582 IONOSPHERE RESEARCH AND PROPAGATION
   Assistant Chief
   Consultant
   Consultant
   .05 Ultra Low Frequency Research
   .10 LF and VLF Research
   .20 Ionosphere Research
   .30 Prediction Services
   .40 Sun-Earth Relationships
   .50 Field Engineering
   .60 Radio Warning Services
   .70 Vertical Soundings Research

Samuel N. Alexander
James P. Nigro
Robert D. Elbourn
James A. Cunningham
Raymond T. Moore
James P. Nigro
Samuel N. Alexander (Acting)
Vacant
G. Franklin Montgomery
Gustave Shapiro
Charles P. Marsden
G. Franklin Montgomery (Acting)
Arnold Wexler
Joshua Stern
Vacant
Dr. Siegfried M. Breuning
Robert L. Stern (Acting)
Gary K. Stonebraker
Jerome A. Yurow
Gary C. McKay
Robert H. Ramsey
Ernest R. Kaswell
Vacant
Vacant
Dr. C. Gordon Little
Jack W. Herbstreit
Dr. James R. Wait
Kenneth A. Norton
Roger M. Gallet
A. Glenn Jean, Jr.
Alan H. Shapley
Dr. James R. Wait
Robert W. Knecht
Thomas N. Gautier
Dr. Lawrence R. Megill
Dr. H. Herbert Howe
Dr. Wallace H. Campbell
Douglass D. Crombie
Dr. Kenneth Davies
Margo Leftin
Dr. Thomas E. VanZandt
Harry G. Sellery
J. Virginia Lincoln
John W. Wright
*583 TROPOSPHERE AND SPACE TELECOMMUNICATIONS
Consultant
Consultant, Terminal Equipment
.10 Data Reduction Instrumentation
.40 Radio Noise
.50 Tropospheric Measurements
.60 Tropospheric Analysis
.70 Spectrum Utilization Research
.80 Radio Meteorology
.90 Lower Atmosphere Physics
Robert S. Kirby (Acting)
Dr. David M. Gates
Edwin F. Florman
Walter E. Johnson
William Q. Crichlow
Martin T. Decker
Philip L. Rice
Albrecht P. Barsis
Bradford R. Bean
Dr. Moody C. Thompson, Jr.

*585 RADIO SYSTEMS
Assistant Chief
Assistant Chief
Consultant
.10 Applied Electromagnetic Theory
.20 HF and VHF Research
.30 Frequency Utilization
.40 Modulation Research
.50 Antenna Research
.60 Radiodetermination
Richard C. Kirby
Donald W. Patterson
William F. Utlaut
George W. Haydon
J. Ralph Johler
Lowell H. Tveten
George W. Haydon
Clark C. Watterson
Herman V. Cottony
Gifford Hefley

*587 UPPER ATMOSPHERE AND SPACE PHYSICS
Assistant Chief
Consultant
Consultant
Consultant
.10 Upper Atmosphere and Plasma Physics
.20 High Latitude Ionospheric Physics
.30 Atmospheric Collision Processes
.50 Ionosphere and Exosphere Scatter
.70 Airglow and Aurora
.80 Ionospheric Radio Astronomy
Dr. Ernest K. Smith, Jr.
Dr. Floyd L. Taylor
Dana K. Bailey
Dr. George C. Reid
Dr. Ralph J. Slutz
Vacant
Dr. Hugh J. A. Chivers
Dr. Eldon E. Ferguson
Dr. Kenneth L. Bowles
Dr. Franklin E. Roach
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
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, Fort 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

Office of the Director

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<tr>
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### 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
  - Dr. Peter L. Heydemann
  - Dr. Gregory J. Rosasco
  - Dr. Richard D. Marshall
  - Judith F. Gilsinn
  - Dr. Seldon L. Stewart
  - Stephen L. Damours

**Analyst, NML**

**Analyst, NEL**

**Analyst, ICST**

**Analyst, DAIS**

### 112 Budget Office

**Chief**
- Thomas A. Gary
- Joseph E. Fones
- Janet B. Miller

**Senior Analyst—Budget Formulation**

**Senior Analyst—Budget Justification**

### 113 Office of the Comptroller

**Comptroller**
- Larry D. Stout
  - David B. Shreve
  - Edgar H. MacArthur
  - John C. McGuffin
  - Henry L. Kenno
  - Eleanor W. Filban

**Deputy Comptroller**

**Special Projects**

**General Accounting**

**Operations**

**Accounts Payable**

### 114 Planning Office

**Chief**
- Raymond G. Kammer, Acting

### 320 Director of Administrative and Information Systems

**Director**
- Richard P. Bartlett, Jr.
  - Joseph C. Aubele

**Program Coordinator**

### 321 Public Information Division

**Chief**
- Richard S. Franzen
  - Ronald E. Meininger
  - Madeleine S. Jacobs
  - Sara R. Torrence

**Audio/Visual Information**

**Media Liaison**

**Special Activities**

### 322 Personnel Division

**Chief**
- Mati Tammaru
  - Sharon April
  - John L. O'Neill
  - James H. Spencer
  - John C. Collins
  - Walter R. Scheltema
  - Marlene O. Posey

**Deputy**

**Labor/Management Relations**

**Personnel Operations/Boulder**

**Employee Development**

**Classification**

**Operations and Procedures**

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<td>K. J. Patrias</td>
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<td>Karl E. Bell</td>
<td>Iris M. Lloyd</td>
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351  Plant Division
Chief
Deputy
Special Projects
Contract Administration
Industrial Planning
Maintenance Engineering
Design Engineering
Apprentice Programs
Steam & Chilled Water Generation
Electric Shop
Piping Shop
Construction Shop
Paint Shop
Sheet Metal Shop
Air Conditioning and Refrigeration
Grounds

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. McKeeley
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
Assistant
Production Control
Engineering Design
Scientific Instrument Shop
Optical Shop
Numerically Controlled Machines
Specialty Shop
Glass Blowing Shop
Welding and Sheet Metal Shop

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
Consultants Supply
Fire Protection Services
Janitorial Services
Mail
Materiel Support
Physical Security
Property and Stores
SRM Support
Telecommunications
Traffic Manager
Transportation Services

Chief Walter J. Rabbitt
Consultants Supply John F. Kennedy
Fire Protection Services Walter C. Bonner, Jr.
Janitorial Services Chief Charles O. Baker
Mail Henry J. Pulver, Acting
Materiel Support Margie E. Kaszuba
Physical Security Charles W. Castle
Property and Stores Capt. Frank Langston
SRM Support Mary L. Davison
Telecommunications George R. Fairchild
Traffic Manager Larry J. Loveland
Transportation Services Robert J. Lewis

354 Occupational Health and Safety Division
Chief
Safety
Health Physics
Medical Office
Workers' Compensation

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
Financial Systems
Staff Services
Safety
Personnel Security
Communications
Physical Security
Program Information
Visual Information

Arthur R. Hauler
Thomas M. Rizzi
Rudolf F. Meyers
Winston W. Scott, Jr.
Ann B. Hamilton
Alden E. Clifford, III
William W. Fabing
Ralph F. Desch
Darwin B. Desch

361 Boulder Supply Services Division
Chief
Deputy
Property Records
Property Utilization
Shipping and Receiving
Mail
Stores
Travel

Johannes S. Roettenbacher
Merle V. Gibson
Carl B. Dieckman
William Kellett
O. Russell Dallman
Ted C. Fahrenholtz
Robert C. Damiana
Dolly A. Quate

362 Boulder Instrument Shops Division
Chief
Production Control
Mechanical Design
Measurements
Glass Shop
Scientific Instruments
Apprentice Program
Tool Crib
Numerical Machines
Welding, Sheet Metal, Plating

William A. Wilson
Kenneth L. Nuss
Victor Lecinski
Lloyd M. Kneebone
Jerry G. Shepherd
Philip F. Biddle
Michael P. Cawley
Ernest L. Rooks
Herbert H. Garing
William F. Decker

363 Boulder Plant Division
Chief
Training Administration
Plant Engineer
Operations Manager
Building Maintenance
Roads and Grounds
Custodial

Vacant
Gordon W. DeKrey
Gary W. Johnson
Kenneth B. Martin
Donald D. Rice
Wilmer L. Schweikert
Leslie C. Chance

410 Director, NBS/Boulder Laboratories
Chief
Program Coordination

Bascom W. Birmingham
Robert D. Harrington
National Measurement Laboratory

Director
Deputy Director for Resources and Operations
Associate Director for Long-Range Planning
Deputy Director for Programs
Executive Officer
Administrative Officer
Senior Science Advisor
Scientific Assistants

Statistical Consultant

Office of Nondestructive Evaluation
Chief
Dr. John D. Hoffman
Dr. Emanuel Horowitz
Dr. David T. Goldman (Acting)
Dr. Donald R. Johnson
Ronald B. Johnson
Robert F. Martin
Dr. Hans J. Oser
Dr. Ian R. Bartky
Dr. Wayne A. Cassatt
Dr. Lucy B. Hagan
Dr. Ruth A. Haines
Lottie T. McClendon
Dr. Gilbert M. Ugiensky
Dr. John Mandel

Office of Environmental Measurements
Chief
Dr. Cary Gravatt (Acting)
Vacant
Dr. Bruce W. Morrissey

Office of Standard Reference Materials
Chief
J. Paul Cali
George A. Uriano
Robert E. Michaelis
Robert Alvarez
R. Keith Kirby
William P. Reed
Richard W. Seward
Ruth H. Meyer

Office of Standard Reference Data
Chief
Dr. David R. Lide, Jr.
Dr. Sherman P. Fivozinsky
Dr. David R. Lide, Jr.
Dr. Lewis H. Gevantman
Dr. Howard J. White, Jr.
Dr. Steven A. Rossmassler
Dr. David R. Lide, Jr.

Office of Measurements for Nuclear Safeguards
Chief
Dr. H. Thomas Yolken

Office of Recycled Materials
Chief
Dr. Donald R. Johnson, Acting

Associate Director for Measurement Services, NML
Associate Director
Dr. Arthur O. McCoubrey, Acting
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540  Center for Thermodynamics and Molecular Science  
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Deputy Director  
Dr. Milton D. Scheer  
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  
Deputy  
Scientific Assistant to the Director  
Service Analysis Coordinator  
Instrument Development Group  
Dr. Philip D. LaFleur  
Dr. Curt W. Reimann  
Dr. Richard A. Durst  
Dr. Robert W. Burke  
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  
Deputy Director  
Assistant for Planning  
Assistant for Other Agency Programs  
Center Scientists  
Signal Processing and Imaging  
Fibrous Systems  
Dr. John B. Wachtman, Jr.  
Dr. Elio Passaglia, Acting  
Dr. Bruce W. Steiner  
Samuel J. Schneider  
Dr. John W. Cahn  
Dr. Robb M. Thomson  
Dr. Melvin Linzer  
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 Division
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
Administrator
John M. Smith

710 Center for Applied Mathematics
Director
Dr. Burton H. Colvin
Deputy
Dr. Joan R. Rosenblatt, Acting
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974
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**

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<td>201</td>
<td><strong>Director</strong></td>
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<td>Dr. Philip N. Nanzetta, Acting</td>
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Non-Energy-Related Inventions Program
Chief
George P. Lewett, Acting

Office of Information Services
Director
Information Systems
Research Resources Development
Research Information Services
Publications Production
WERB Secretary
Patricia W. Berger
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Sharon E. Bisco
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Document Control
Cost Control
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Advances and Reimbursements
Systems
Billing and Collections
Accounting and Reports
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Pipe Shop
Construction Shop
Grounds and Service Support
Planning and Engineering
Operations and Maintenance
Administrative Office
Project Management
Construction Contracts
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Device Technology
Integrated Circuits Technology

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Fields and Interference Metrology
Antenna Metrology

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Cryoelectronic Metrology
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Manager, Manufacturing Programs
Manager, Industrial Relations

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Machine Metrology
Micrometrology
Microelectronics Dimensional Metrology
Surface and Particle Metrology

822 Automated Production Technology Division
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Mass
Ultrasonic Standards
Sound and Vibration
Sensor Systems
Sensor Integration
Force

823 Robot Systems Division
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Performance Measures
Intelligent Controls
Systems Integration
Sensory Intelligence
Unmanned Systems
824 Factory Automation Systems Division
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CALS/PDES Project  
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Product Data Engineering  
Integrated Systems  
Machine Intelligence

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Vacant  
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Mark E. Luce  
Cita M. Furlani  
Dr. Selden L. Stewart  
Dr. Theodore H. Hopp

825 Fabrication Technology Division
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Apprentice Program  
Glassblowing  
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Special Shops  
Optical Shop  
Planning and Estimating  
Tool Crib  
Metal Storeroom  
Main Shop  
Sheet Metal and Welding Shops

Adrian W. Moll  
Charles Summers  
Sherman Reeder  
Jeffrey Kelley  
Sherman Reeder  
Kenneth Wiltshire  
Kenneth Wiltshire  
Jeffrey Kelley  
Jeffrey Kelley

830 Chemical Science and Technology Laboratory  
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Deputy Director for Programs  
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Senior Management Advisor

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Barry I. Diamondstone  
Dr. Ruth A. Haines  
Dr. James F. Ely  
Robert F. Martin

831 Biotechnology Division
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Biophysical Measurements  
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Dr. Dennis J. Reeder  
Dr. Stanley Abramowitz  
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832 Chemical Engineering Division, Boulder  
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833 Chemical Kinetics and Thermodynamics Division
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834 Inorganic Analytical Research Division
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Electroanalytical Research  
Atomic and Molecular Spectrometry  
Nuclear Methods

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Dr. Howard M. Kingston  
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Dr. Robert R. Greenberg
835 Organic Analytical Research Division  
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Separation Science: Dr. Stephen A. Wise

836 Process Measurements Division  
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High Temperature Processes: Dr. Andrej Macek  
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Surface Spectroscopies and Standards: Dr. Cedric Powell

838 Thermophysics Division, Gaithersburg and Boulder  
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Properties of Fluids: Dr. William M. Haynes  
Fluid Science: Dr. Michael R. Moldover  
Pressure: Dr. Charles D. Ehrlich  
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Subsecond Thermophysics: Dr. Ared Cezairliyan

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Deputy Director: Dr. William R. Ott

841 Electron and Optical Physics Division  
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Electron Physics: Dr. Robert J. Celotta

842 Atomic Physics Division  
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Atomic Radiation Data: Dr. Yong-Ki Kim  
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Electronics Instrumentation
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Dr. David W. Norcross
Dr. David W. Norcross
Dr. David W. Norcross
Dr. David W. Norcross

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Tribology
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Electronic Materials
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Optical Materials
Dr. Stephen Freiman
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Cryogenic Materials
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Welding
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Mechanical Performance
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Dr. Donald L. Hunston
Polymer Blends and Solutions
Dr. Charles C. Han
Dental and Medical Materials
Dr. John A. Tesk

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Metallurgical Processing
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Dr. John W. Hastie
Mechanical Properties and Performance
Dr. Leonard Mordfin
Corrosion
Dr. Richard E. Ricker
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Dr. David S. Lashmore
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Dr. H. Thomas Yolken, Acting

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Tawfik M. Raby
Neutron-Condensed Matter Science
Dr. John J. Rush
Cold Neutron Project
Dr. J. Michael Rowe

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Deputy Director
Dr. Jack E. Snell
Assistant Director
James G. Gross
Office of Technology Transfer
Richard W. Bukowski
861  Structures Division
Chief
Structural Evaluation
Earthquake Engineering
Dr. Hai S. Lew
Dr. Hai S. Lew
Dr. Hai S. Lew

862  Building Materials Division
Chief
Organic Building Materials
Inorganic Building Materials
Construction Materials Reference Laboratories
Dr. Geoffrey J. Frohnsdorff
Lawrence W. Masters
Dr. James R. Clifton
James H. Pielert

863  Building Environment Division
Chief
Thermal Machinery
Mechanical Systems and Controls
Heat Transfer
Computer Integrated Construction
Indoor Air Quality and Ventilation
Lighting
Dr. James E. Hill
Dr. David A. Didion
Dr. George E. Kelly
Dr. A. Hunter Fanney
Dr. Kent A. Reed
Dr. Andrew K. Persily
Dr. Belinda L. Collins

864  Fire Science and Engineering Division
Chief
Building Fire Physics
Combustion and Flammability
Fire Dynamics
Dr. Andrew J. Fowell
Dr. John H. Klate
Dr. Takashi Kashiwagi
Dr. Henri E. Miller

865  Fire Measurement and Research Division
Chief
Smoke Dynamics Research
Fire Toxicity Measurement
Fire Hazard Analysis
Fire Suppression Research
Dr. Richard G. Gann
Dr. William M. Pitts
Dr. Vytenis Babrauskas
Dr. Walter W. Jones
Dr. David D. Evans

870  Computer Systems Laboratory
Director
Associate Director for Computer Security
Voluntary Standards Liaison
Program Coordination and Support
Standards Processing Coordinator
Senior Management Advisor
James H. Burrows
F. Lynn McNulty
Robert Rountree, Jr
Shirley M. Radack
Barbara L. Blickenstaff
Judith L. Lyons

871  Information Systems Engineering Division
Chief
Database and Graphics
Data Administration
Graphics Software
Software Standards Validation
Dr. David K. Jefferson
Joseph C. Collica
Bruce K. Rosen
Mark W. Skall
L. Arnold Johnson

872  Systems and Software Technology Division
Chief
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Office Systems Engineering
Allen L. Hankinson
Roger J. Martin
Lawrence A. Welsch
Computer Security Division
Chief
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Security Technology
Protocol Security
Computer Security Planning and Assistance

Dr. Stuart W. Katske
Dennis D. Steinauer
Miles E. Smid
Robert Rosenthal
Eugene F. Troy

874 Systems and Network Architecture Division
Chief
Network Applications
Automated Protocol Methods
Network Management
Network Protocols

Kevin L. Mills
Gerard F. Mulvenna
Kevin L. Mills, Acting
Frances H. Nielsen
Richard P. Colella

875 Advanced Systems Division
Chief
Speech Recognition
Parallel Processing
Data Storage
Distributed Systems
Image Recognition
Advanced Communications

Shukri A. Wakid
David S. Pallett
Robert J. Carpenter
Dana S. Grubb
Wayne McCoy
Dr. Charles L. Wilson
David H. Su

880 Computing and Applied Mathematics Laboratory
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Deputy Director
Assistant Director for Boulder
Associate Director for Computing
Assistant Director for Management Information Technology
Office of Applied Economics

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Dr. Joan R. Rosenblatt
Dr. John A. Brown
Dr. Frederick C. Johnson
Dr. Alvin H. Sher
Dr. Harold E. Marshall

881 Applied and Computational Mathematics Division
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Mathematical Modeling and Software-Boulder
Microprocessor
Numerical Optimization

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Dr. James L. Blue
Dr. John M. Gary
Dr. David K. Kahaner, Acting
Dr. Paul T. Boggs

882 Statistical Engineering Division
Chief
Statistical Engineering-Boulder

Dr. Robert J. Lundegard
Dr. Dominic F. Vecchia
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<td>Dr. Sally E. Howe</td>
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<td>User and Software Support</td>
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<td><strong>884  Computer Services Division</strong></td>
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<td>Chief</td>
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<td><strong>886  Information Systems Division</strong></td>
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<td>Patsy B. Saunders</td>
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<td>Patsy B. Saunders</td>
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<td>User Information and Database</td>
<td>Robert Lee</td>
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<td>Systems Design and Programming</td>
<td>Gordon B. Gipe</td>
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