National Engineering Laboratory

U.S. Department of Commerce
National Bureau of Standards
Washington, D.C. 20234

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CONTENTS

NATIONAL ENGINEERING LABORATORY

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National Engineering Laboratory
National Bureau of Standards
U.S. Department of Commerce
Washington, DC 20234

Forword

The National Engineering Laboratory, a technical component of the National Bureau of Standards, provides the public and private sectors with improved technology and technical services that address national needs by developing engineering measurements and data; test methods and proposed engineering standards and code changes; and new engineering practices. The Laboratory conducts research in engineering and the applied sciences and builds and maintains competences in the scientific disciplines required to carry out this research.

Major program goals of the Laboratory include increasing the usefulness, safety, and economy of buildings; measuring the performance attributes of consumer products; improving the productivity, reproducibility, and reliability of electrical and electronic components and systems; developing measurement methods, data and technology for discrete and continuous process manufacturing; helping to make buildings, communities, and industrial processes more efficient in terms of energy use; and contributing to the health and safety of the Nation through such activities as reducing losses from unwanted fires, electromagnetic radiation measurements, and the development of technology for use in such commercial operations as the shipping and storing of liquified natural gas.

CENTER FOR APPLIED MATHEMATICS

Director, Dr. Burton H. Colvin
Deputy Director, Dr. Joan R. Rosenblatt
Telephone: 301 921-2541

The Center for Applied Mathematics conducts research and supports NBS activities and other Federal agencies in selected fields of the mathematical and computer sciences. The Center also develops such mathematical tools as statistical models and computational methods, mathematical tables, handbooks, and manuals.

Mathematical Analysis Division

Chief, Dr. Frederick C. Johnson, 301 921-2631

- Provides consulting services, performs research, and collaborates in the application of mathematical analysis, numerical analysis and requisite computer science technology to science and engineering
- Develops and applies mathematical models to complex scientific and management problems in physical and engineering systems
- Provides computational techniques for NBS scientific computation and data processing
- Collaborates in the development and application of mathematical methods including modern non-linear theories of fluid mechanics, solid mechanics, and finite element methods

Sample Outputs Include:
- Mathematical model for buoyant flow in a room fire
- Applications and solutions of partial differential equations
- Computational mathematics for obtaining numerical solutions

Operations Research Division

Acting Chief, Dr. Christopher J. Witzgall, 301 921-3855

- Provides consulting and collaborative services in the application of mathematical operations-research methods to the analysis and improvement of complex systems of equipment or activities arising in NBS programs and (when appropriate) in the work of other Government agencies.
- Develops and disseminates methods for construction and evaluation of the large-scale discrete mathematical models, simulations, and algorithms required in such studies
- Performs research in supporting areas of mathematics such as numerical and combinatorial optimization, network analysis, and mathematical economics

Sample Outputs Include:
- Linear programming technique for retrofitting health care facilities to meet safety codes
- Methods and software for quantifying passenger selection of transportation modes
- Methods for evaluating building evacuation

- Method for relating lead content in air to blood lead level in children
- Evaluation and assessment of mid-term energy forecasting models

Scientific Computing Division

Chief, Dr. Glenn R. Ingram, 301 921-3395
Boulder Staff - Mr. William J. Hall, 303 497-5433 (FTS 8 320-5433)

- Provides consulting services, performs research, and collaborates in the application of computer science and technology to computation problems in physical science and engineering at NBS
- Plans and designs new computer facilities and systems appropriate to the range of problems from laboratory automation to large calculations and provides support for appropriate network communication
- Develops, installs and uses specialized software systems, processors, and languages for numerical computation and non-numerical information processing
- Evaluates and validates algorithms both for numerical calculations and for mini-and micro-processor based scientific instrumentation

Sample Outputs Include:
- Hardware and software support for NBS mini computers
- Numerical analysis and mathematical software for NBS

Statistical Engineering Division

Chief, Dr. Harry H. Ku, 301 921-3651
Boulder Staff - Dr. Peter V. Tryon, 303 497-5356
(FTS 8 320-5356)

- Provides consulting services in the application of mathematical statistics to physical science experiments and engineering tests
- Collaborates in the development and implementation of statistical quality control procedures for measurement operations and of statistical sampling procedures for monitoring and field inspection activities based on physical measurements and test methods
- Contributes to the development of appropriate statistical techniques on a foundation of research on pertinent topics in probability and mathematical statistics
- Conducts studies of computational methods and prepares reports, manuals, tables, handbooks, and tools for statistical computing

Sample Outputs Include:
- Statistical Certification of Standard Reference Materials samples
- Measurement Assurance Program for gage blocks
- DATAPLOT computer software for data analysis model building

Computer Services Division

Chief, Mr. M. Ray Shaver, 301 921-3424

- Operates the NBS central computing facility
- Provides the systems software and hardware support required for efficient operation of the facility
- Monitors computer performance and determines needs for additional hardware and systems software
- Maintains records of use of computing resources
- Provides users with consulting services and training in the effective utilization of the computing resources

Sample Outputs Include:
- Daily computing services to NBS and other Federal agency users in the processing of interactive and batch computer runs
- Development of a plan to divide the NBS computing workload between two UNIVAC 1108 systems
- On-the-job training in computer operations for NBS divisions

CENTER FOR ELECTRONICS & ELECTRICAL ENGINEERING

Director, Mr. Judson C. French
Deputy Director, Dr. Alvin H. Sher
Telephone: 301 921-3357

The Center for Electronics and Electrical Engineering conducts research, development, and applications in the field of electronic and electrical materials and engineering. The Center also develops practical data, measurement methods, theory, standards, and technology, and provides technical services, national reference standards, and engineering measurement traceability for the benefit of government, industry, the scientific community, and the consumer.

Electron Devices Division

Chief, Dr. W. Murray Bullis, 301 921-3786

- Develops and evaluates measurement methods, data, and associated technology for the characterization of electron devices, and the materials, processes, and equipment used in their manufacture
- Disseminates and fosters application and standardization of these methods for the marketplace exchange of devices, equipment, and materials, and for the enhancement of performance and reliability for electron devices and the systems in which they are applied

Sample Outputs Include:
- Updated resistivity-dopant density relationships for silicon
- Optical linewidth measurements in the 0.5- to 12-um range
- Well-characterized microelectronic test structures for dimensional metrology and semiconductor characterization

Electrosystems Division

Chief, Dr. Oskars Petersons, 301 921-3238

- Develops and evaluates measurement methods, data, and associated technology for characterizing and defining performance parameters of electrical/electronic systems, components, and materials
- Applies these to the advancement of dynamic measurement instrumentation and sensors, and to the efficient utilization of electric power transmission and distribution systems
- Develops and maintains national reference standards for practical electrical units derived from the basic units

Sample Outputs Include:
- Phase-angle calibration standard with accuracy of ±0.005 degree and angular resolution of 0.002 degree over the frequency range
- Automated test facility for determining static transfer characteristics of high-performance analog-to-digital and digital-to-analog data converters
- Characterization of performance of insulating

materials for electric power systems by means of electro-optical techniques

- Development of physical standards for metering of electric energy and the dissemination of these standards through calibrations

Electromagnetic Fields Division

Acting Chief, Mr. Charles K. S. Miller, 303 497-3131 (FTS 8 320-3131) Boulder, Colorado

- Develops and evaluates systems, devices, and techniques to measure and analyze free electromagnetic fields and their interaction with dielectric bodies, antennas, and other emitters and receivers
- Applies these to remote determination of the properties of dielectric bodies and evaluation of antennas, electromagnetic interference, and electromagnetic radiation hazards

Example Outputs Include:
- Theory for single-mode operation making transverse electromagnetic cell useful for measuring electromagnetic interference
- Theoretical base for making near field measurements of antenna parameters

Electromagnetic Technology Division

Chief, Dr. Robert A. Kamper, 303 497-3535 (FTS 8 320-3535), Boulder, Colorado

- Develops, evaluates, and applies systems, devices, and techniques to measure and analyze electromagnetic signals (both pulsed and continuous) confined in waveguide structures or laser beams, and the transmission characteristics of such structures
- Provides national reference standards and measurement services required to determine the characteristics of guided wave systems and lasers
- Promotes the application of superconductivity and other low temperature phenomena to new electrical measuring techniques and systems, and assists other divisions of NBS to adapt them to their needs

Sample Outputs Include:

- Dual six-port automatic analyzer for measuring all network parameters of two-port devices
- Ultra-fast analog-to-digital six-bit data converter with a measured operating speed of 200 mega samples per second and an on-chip sampler with a resolution of nine picoseconds
- Stirling-cycle refrigerator for providing operating conditions required by superconducting electronic devices

CENTER FOR MECHANICAL ENGINEERING & PROCESS TECHNOLOGY

Director, Dr. John A. Simpson
Deputy Director, Mr. Gene A. Rowland

Telephone: 301 921-3421

The Center for Mechanical Engineering and Process Technology provides competence in production engineering, mechanical metrology, automation and control technology, and industrial and mechanical engineering in support of the discrete parts manufacturing industries.

Mechanical Production Metrology Division

Acting chief, Mr. Daniel R. Flynn, 301 921-3565

- Develops and maintains competence in engineering measurements and sensors both static and dynamic of force, mass, dimensions and other parameters needed for inspection, quality control, and process control and monitoring in the discrete parts industry.

Sample Outputs Include:
- Physical standards for ultrasonic flaw detection
- Standards and measurement technology for particulates
- Fundamental studies in optical metrology
- Calibrations of force to 1 million lbs deadweight
- Physical standards for surface roughness

Automated Production Technology Division

Acting Chief, Dr. Robert Hocken, 301 921-2216

- Develops and maintains competence in machine tool dynamics, robotics, and the integration of metrology into the precision metal working processes, including the standards necessary for integration of equipment up to the manufacturing cell level.

Sample Outputs Include:
- Calibration of liquified nitrogen gas supertankers with aggregate volume exceeding 13 billion feet^3 of gas
- Calibration and MAP's for gage blocks and other dimensional standards
- Error correction algorithms for measuring machine and machine tools

Industrial Systems Division

Acting Chief, Dr. Russell Young, 301 921-2181

- Develops and maintains competence in systems engineering, industrial engineering, parametric and sensitivity analysis, general adaptive control technology, and produces evaluated data, performance criteria and technical analyses relating to the feasibility of manufacturing systems, including robots.

Sample Outputs Include:

- Robotics, including vision systems
- Standards for computer aided design and manufacture
- Measurement technology and calibration for acoustic sensors

CENTER FOR BUILDING TECHNOLOGY

Director, Dr. Richard N. Wright
Deputy Director, Dr. Charles G. Culver
Telephone: 301 921-3377

The Center for Building Technology performs analytical, laboratory, and field research involving architecture, engineering, and the physical and social sciences, and produces performance criteria and measurement technology for use by building owners, occupants, designers, manufacturers, builders, regulatory authorities of State and local governments, and Federal agencies with building programs. Much of the Center's work in fulfilling its responsibilities for other Federal agencies is mandated by the Solar Heating and Cooling Demonstration Act of 1974, the Energy Policy and Conservation Act of 1975, the Energy Conservation and Production Act of 1976, the Earthquake Hazards Reduction Act of 1977, and the National Energy Act of 1978.

Structures and Materials Division

Chief, Dr. Edward O. Pfrang, 301 921-2196

- Conducts research in structural, geotechnical, and materials engineering, including: normal and extreme loads on buildings and the probabilities of loadings, and structural failures and methods for providing desired reliability
- Develops building design criteria for reduction of lives lost, injuries, and property damage due to natural hazards
- Develops test methods and design criteria for foundations
- Develops evaluation methods and criteria for safe and economical construction practices
- Evaluates durability of building materials
- Assists in the development and implementation of design standards, and test and measurement methods for the strength and durability of structures, building components, and materials

Sample Outputs Include:
- Technical data for building construction safety standards
- Technical data for building performance in earthquakes
- Technical data for materials durability standards

Building Thermal Performance Division

Chief, Dr. Preston E. McNall, 301 921-3637

- Conducts research on the dynamic thermal performance of the building envelope, the internal and external environment
- Conducts research on improved techniques and equipment for measuring the flow of heat, moisture, and air through insulating materials and building components
- Conducts research on the thermal performance of passive and active solar heating and cooling systems

Sample Outputs Include:
- Predictive models for estimating annual building energy use
- Criteria for improving thermal performance of insulating materials and building envelope
- Techniques for measuring and evaluating the thermal performance of passive and active solar heating and cooling systems and subsystems

Environmental Design Research Division

Chief, Dr. Francis T. Ventre, 301 921-3704

- Conducts research on accessibility and safety of buildings as affected by configuration, lighting, and other parameters and on the security of doors, windows, and public spaces in buildings

- Improves methods for defining users' needs for productive and serviceable environments in and around buildings, including spatial, acoustical, and visual factors
- Develops communications techniques and designs for safer evacuation of buildings in emergencies, including the capabilities and needs of special users such as the elderly and handicapped
- Improves formulation of performance-based building design procedures and criteria by analyzing buildings in use

Sample Outputs Include:
- Rational basis for recommending lighting quantities and qualities needed for various visual tasks
- Mathematical methods for simulating normal and emergency movement of building occupants
- Improved techniques for analyzing and simulating the effects of time-varying noise

Building Economics and Regulatory Technology Division

Chief, Mr. James G. Gross, 301 921-3447

- Develops techniques for formulating and expressing performance criteria, codes, and standards
- Develops techniques to improve productivity in the building rehabilitation process

- Develops techniques and data requirements for assessing the impacts of building standards and regulations
- Develops methodologies for benefit-cost and life-cycle cost evaluations for decisionmakers in the building community
- Provides program management for development and validation of performance standards and criteria for solar heating and cooling of buildings
- Provides technical support for outside organizations dedicated to improvement of building regulations

Sample Outputs Include:
- A life-cycle costing guide for selecting energy conservation projects
- Criteria and evaluation procedures for solar heating and cooling systems
- Evaluation methods for building rehabilitation

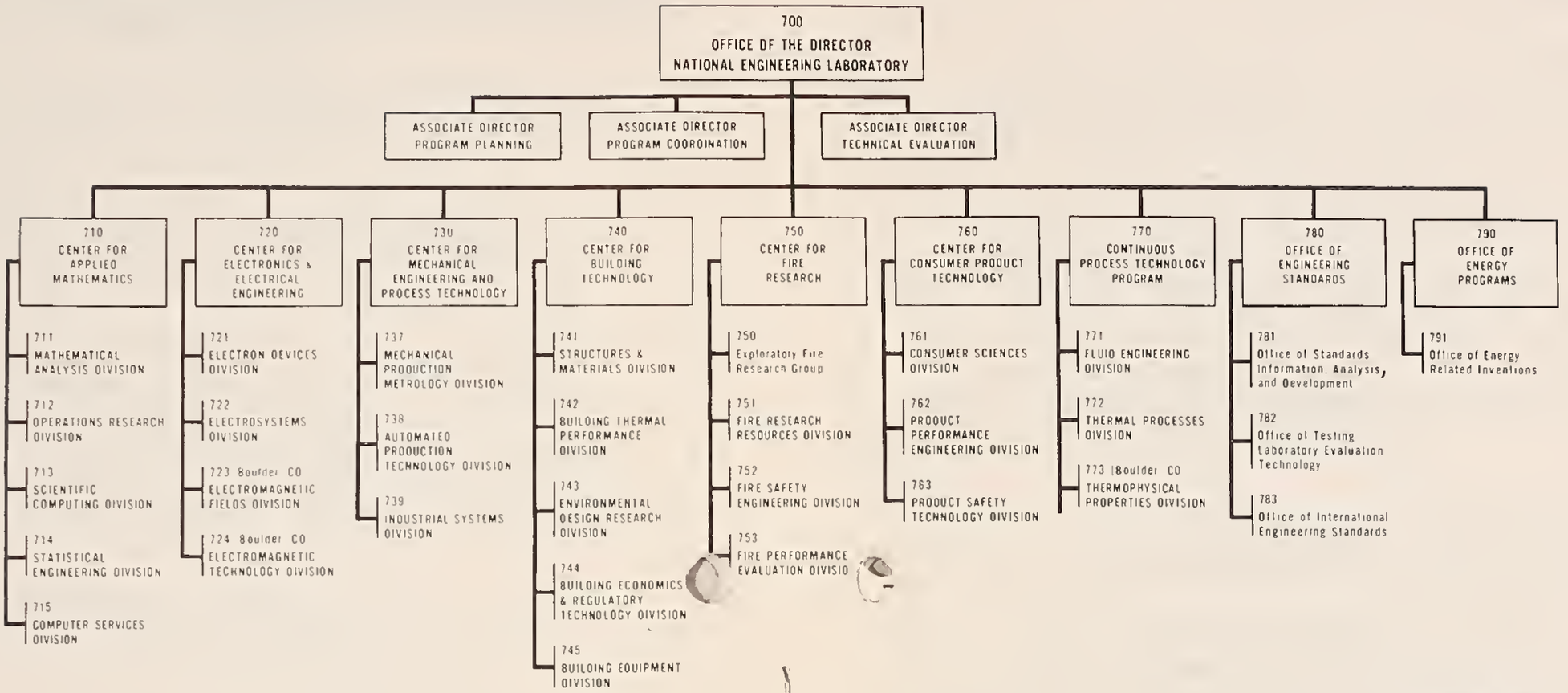
Building Equipment Division

Chief, Dr. James E. Hill, 301 921-3637

- Conducts research on improved techniques for measuring and evaluating the performance of HVAC equipment, service systems, and controls for buildings
- Conducts research to improve the performance of plumbing, electrical, and illumination systems in buildings, controls, and HVAC systems

Sample Outputs Include:

- The development of data, guidelines, and criteria for improving the performance of building mechanical systems
- Guidelines and criteria for improving the performance of building service systems



SEPTEMBER 1980

CENTER FOR FIRE RESEARCH

Director, Dr. Frederic B. Clarke
Deputy Director, Dr. Clayton Huggett
Associate Director, Mr. Richard L. P. Custer
Telephone: 301 921-3143

The Center for Fire Research performs and supports research on all aspects of fire and develops scientific and technical knowledge applicable to the prevention and control of fires as described in the Federal Fire Prevention and Control Act of 1974. Basic and applied fire research and research into the biological, physiological, and psychological factors affecting human fire victims are included. The Center also provides policy level liaison with the Federal Emergency Management Agency and coordinates fire research activities with the U.S. Fire Administration.

Exploratory Fire Research Group

Head, Dr. Richard Gann, 301 921-3771

- Carries out long range fundamental and exploratory studies of the physical and chemical processes which underlie macroscopic fire phenomena, including chemical processes in burning solids and flames, the formation and properties of smoke particulates and toxic gases, mass and energy transport in flames, the mechanism of action of fire retardants, and ignition, flame spread and flame extinguishment processes

- Devises new techniques for studying these phenomena
- Furnishes fundamental scientific information to support the activities of the Fire Safety Engineering Division and the Fire Performance Evaluation Division

Sample Outputs Include:
- Mechanism of cellulose smoldering retardance by sulfur
- Characterization of soot particles
- Determination of effects of sample orientation on radiative ignition
- Comparison of principles for measuring rate of heat release

Fire Research Resources Division

Chief, Dr. Robert Levine, 301 921-3845

- Manages the grants and contracts program for basic and applied fire research to complement in-house research
- Provides policy level and planning liaison in the Center's Extramural Research Program
- Maintains a fire research information center
- Maintains and operates the Center's in-house computing facility
- Manages the Center's fire investigation and arson control related activities

Sample Outputs Include:
- CFR Annual Conference with contractors and grantees
- Arson Investigator's Handbook
- Translations of pertinent foreign fire literature
- Literature searches and report distribution to the fire community
- Concensus standards for arson laboratory analyses

Fire Safety Engineering Division

Chief, Mr. Irwin Benjamin, 301 921-3255

- Plans, coordinates, and conducts research and engineering studies applicable to designs for fire safety and the evaluation of fire risks and hazards in structures
- Conducts programs to assess the biological and physiological effects of fire, smoke, and toxic gases; develops mathematical and physical models of fire growth and spread; evaluates the effectiveness of detectors, sprinkler systems, and other suppression devices; develops fire safety evaluation systems, design data, and performance criteria which integrate the results of fire research into practical cost-effective fire safety systems
- Coordinates the Center's work on voluntary standards; maintains liaison with code and standards organizations and with Federal agencies to promote the use of fire safety design concepts and practices

Sample Outputs Include:
- Mathematical modeling of fire-driven flow through doorways
- Method for measuring toxicity and incapacitating characteristics of gases emanating from burning materials
- Fire safety evaluation systems for life safety
- Test method for evaluating smoke detectors
- Decision analysis on quantitative effectiveness of proposed flammability standards for upholstered furniture

Fire Performance Evaluation Division

Acting Chief, Mr. Richard L. P. Custer, 301 921-3143

- Plans, coordinates, and conducts research and development studies to evaluate the fire and high temperature performance of materials, products, and construction assemblies
- Develops and improves test methods and analytical techniques to measure ignitability, flammability, heat release, and smoke generation from textiles, furnishings, and other consumer products, electrical and industrial equipment, building materials and assemblies and transportation systems
- Maintains liaison with government and voluntary standards organizations to promote the use of new and improved test methods and performance criteria for greater fire safety
- Manages the Center's large scale fire experimental facilities

Sample Outputs Include:

- Test methods for measuring flame spread and smoldering properties of cellulose insulation
- Recommendations for upgrading fire safety requirements for mobile homes
- Flooring radiant panel test for evaluating flammability performance of floor covering systems for use in corridors and exitways

CENTER FOR CONSUMER PRODUCT TECHNOLOGY

Director, Dr. Stanley I. Warshaw
Deputy Director, Mr. John L. Donaldson

Telephone: 301 921-3751

The Center for Consumer Product Technology performs research and develops the technology needed to measure and evaluate the safety, energy efficiency, and other performance characteristics of consumer products and law enforcement equipment. The Center also disseminates the information developed to the public. Much of the Center's work for other Federal agencies is mandated by the Consumer Product Safety Act of 1972, the Energy Policy and Conservation Act of 1975, the Energy Conservation and Production Act of 1976, and the National Energy Act of 1978. In addition, the Center fulfills the Secretary of Commerce's responsibilities under the Fair Packaging and Labeling Act of 1966.

Consumer Sciences Division

Chief, Dr. Harold P. Van Cott, 301 921-2907

- Applies the data, theory, and methods of the behavioral sciences, ergonomics, anthropometry, biomechanics, and systems analysis to programs concerned with product technology, safety, and energy efficiency
- Conducts controlled laboratory and field research and conducts survey research to characterize, measure, and predict product-user attributes and consumer product interactions

- Assists in providing industry, consumers, and other agencies with information related to the product-consumer interface, product usage and product safety
- Evaluates the impact of Center programs in the area of product technology

Sample Outputs Include:
- Revisions to U.S. Coast Guard test procedure of shock impact on boat fuel tank
- Characterization of capabilities of energy-use feedback meter
- Development of surrogates to probe hazardous consumer products

Product Performance Engineering Division

Chief, Dr. Andrew J. Fowell, 301 921-3748

- Conducts engineering analysis and develops product test methods for addressing energy efficiency and other performance attributes of consumer products
- Evaluates new or improved product designs for energy efficiency
- Develops accelerated test methods for measuring and predicting product performance changes with time

Sample Outputs Include:
- Test methods for measuring energy consumption of major appliances
- Energy-conserving modifications for water heaters
- Compact watt-hour meter and in-line elapsed

- Compact watt-hour meter and in-line elapsedtime cycle counter for obtaining information on appliance usage

Product Safety Technology Division

Chief, Mr. Walter G. Leight, 301 921-3750

- Provides hazard analysis and engineering capability for test development and evaluation of safety relating to commercial and household products, including toys and industrial components
- Develops instrumentation for measuring hazardous attributes of products
- Evaluates safety hazards associated with the design of products
- Develops and implements new activities in support of other Government-sponsored programs

Sample Outputs Include:
- Modeling eye impact injury phenomenon and developing recommended test protocols for missile-firing toys
- Supporting the Consumer Product Safety Commission in developing standards for such products as Christmas tree light strings
- Modeling impact attenuation characteristics of protective headgear

CONTINUOUS PROCESS TECHNOLOGY PROGRAM

Director, Mr. Jesse Hord
Acting Deputy Director, Dr. Kenneth Kreider

Telephone: Director - 303 497-5108 (FTS 8 320-5108) Boulder, Colorado
Acting Deputy Director - 301 921-3281

The Continuous Process Technology Program serves the continuous process industries (chemical, petrochemical, petroleum, rubber, metals, etc.) and helps these industries to meet their measurement and data needs. The Program performs basic and applied research to provide engineering design data, measurement principles and standards, data-predictive models, design concepts and correlations, and measurement services and traceability for industry, academia, and government.

Thermophysical Properties Division

Acting Chief, Mr. Neil A. Olien, 303 497-5108 (FTS 8 320-5108) Boulder, Colorado

- Develops and maintains competence in the measurement, theory, and prediction of the thermophysical properties of fluids and materials of importance to the continuous process industries
- Performs basic and applied research in unit operations (such as heat and mass transfer, separation and mixing), systems engineering, and thermodynamic analysis of industrial processes

Sample Outputs Include:
- Manual of materials and fluids properties for hydocarbons and their mixtures
- Computer programs for the calculation of thermodynamic and transport properties of industrial chemicals and fuels for process design and custody transfer
- Measurement Standards and Standard Reference Materials for bulk thermal insulation and other composite/heterogeneous materials
- Transfer standards for liquid density and mass flow and heat transfer correlations for cryogenic fluid systems

Fluid Engineering Division

Acting Chief, Dr. Kenneth G. Kreider 301 921-3681

- Develops and maintains competence in fluid mechanics and flow characterization (turbulence, multiphase flow regimes, etc.)
- Develops and maintains competence in the measurement of mass flow, density, and volume
- Provides technical data, mathematical models, advanced measurement techniques (such as smart sensors systems), and measurement services to industry and Government

Sample Outputs Include:
- Fluid volume and flow measurement calibrations to assure marketplace equity
- Archival data for understanding turbulent flow processes

- Mathematical models for analyzing fluid meter performance in closed conduits
- Adaptation of acoustic techniques to measure volumetric gas flow

Thermal Processes Division

Chief, Dr. Kenneth G. Kreider 301 921-3681

- Develops and maintains competence in combustion, engineering kinetics, and related heat transfer, unit process modeling, thermal properties of materials, instrumentation, and automatic control technology for thermal processes
- Provides technical information, engineering standards, performance evaluation methods, and base technology for thermal processes such as heating, boiling, drying, smelting, power generation, and heat recovery

Sample Outputs Include:
- Assemblage and firing of experimental furnace facility for evaluating and developing diagnostic measurements and control techniques for efficient energy use
- Identification of radiative heat transmission as significant source of error in hot wire method of measuring thermal conductivity in high temperature refractories
- Development of a fiber optic temperature sensor for measurement of combustor gas temperatures to 2400°C

materials for electric power systems by means of electro-optical techniques

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- Provides national reference standards and measurement services required to determine the characteristics of guided wave systems and lasers
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Sample Outputs Include:

- Dual six-port automatic analyzer for measuring all network parameters of two-port devices
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OFFICE OF ENGINEERING STANDARDS

Director, Dr. Stanley I. Warshaw
Deputy Director, Mr. William C. Cullen
Telephone: Director: 301 921-3751
Deputy Director: 301 921-3731

The Office of Engineering Standards provides domestic and international engineering standards services, assists in the development of needed voluntary product standards, assists laboratories in developing criteria and procedures for testing materials and products, and develops a system for accrediting testing laboratories in the United States. The Office is also responsible for fulfilling several of the Bureau's responsibilities under the Trade Agreement Act of 1979.

Office of Standards Information, Analysis, and Development

Chief, Mr. James E. French, 301 921-3272

- Manages the NBS Standards Information Service
- Manages the Department of Commerce's Voluntary Product Standards Program
- Provides management information systems for NBS participation in voluntary standards activities
- Develops special standards information systems for other Federal agencies
- Studies the technical and economic impact of engineering standards

Sample Outputs Include:
- Overview of standards systems in Canada, United Kingdom, and Denmark
- Report of NBS participation in standards development activities
- Analysis of regulatory use of standards with implications for standards writers
- Indexes of voluntary standards
- Indexes of energy-related standards

Office of Testing Laboratory Evaluation Technology

Chief, Mr. James O. Bryson, 301 921-2368

- Manages development and operation of programs for evaluating testing laboratory performance
- Provides technical support to the Department of Commerce's National Voluntary Laboratory Accreditation Program

Sample Outputs Include:
- National Conference on Laboratory Performance Evaluation and Accreditation
- Evaluation of 30 laboratories that test thermal insulation materials
- Criteria for accrediting laboratories that test freshly mixed concrete

Office of International Engineering Standards

Chief, (Vacant), 301 921-2152

- Provides international engineering standards coordination services
- Serves as NEL liaison with international organizations that write and apply engineering standards

OFFICE OF ENERGY PROGRAMS

Director, Dr. Jack E. Snell

Deputy Director, Dr. Albert E. Paladino

Telephone: 301 921-3275

The Office of Energy Programs provides overall planning, management, and coordination of the NEL energy-related programs including the energy-related invention program. These programs address the development of performance criteria and measurement technology needed to meet national goals for energy conservation and conversion in buildings, consumer products, and industry as well as for alternate energy supply technologies.

The Office serves as a focal point between NEL technical units, the Department of Energy and other energy organizations. It also serves as a focal point for collaborative programs with other Federal agencies in this field as required by the Solar Heating and Cooling Demonstration Act of 1974, the Federal Non-Nuclear Energy research and Development Act of 1974, the Energy Policy and Conservation Act of 1975, the Energy Conservation and Production Act of 1976, and the National Energy Act of 1978.

Office of Energy-Related Inventions

Chief, Mr. George P. Lewett, 301 921-3694

- Reviews, analyzes, and evaluates inventions submitted by inventors to determine technical validity, energy conservation value, and practicability
- Recommends to the Department of Energy those inventions deemed worthy of support

Sample Office of Energy Programs' Outputs Include:

- Department of Energy/Department of Commerce National Program Plan for Building Envelope Systems and Insulation Materials
- Initiation of coordinated multi-year program planning with select units of DoE
- Yearly recommendations to DoE of approximately 35 energy-related inventions

Name Telephone

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Notes:

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980 O—327-228