93D CONGRESS 2d Session } HOUSE OF REPRESENTATIVES { REPORT No. 93-795

FIRE PREVENTION AND CONTROL ACT OF 1974

FEBRUARY 7, 1974.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. TEAGUE, from the Committee on Science and Astronautics, submitted the following

REPORT

[To accompany H.R. 11989]

The Committee on Science and Astronautics to whom was referred the bill (H.R. 11989) to enhance the public health and safety by reducing the human and material losses resulting from fires through better fire prevention and control, and for other purposes, having considered the same, report favorably thereon without amendment and recommend that the bill do pass.

PURPOSE OF THE BILL

Losses from fires have reached very high levels in the United States.[1] Each year more than 12,000 persons lose their lives as a direct result of fires and many tens of thousands are injured and maimed. Close to two hundred of those lost are firefighters who die in the performance of their dangerous duty. The losses in property are equally large, and are estimated to exceed $2 billion each year. Other indirect costs of fire, for example the cost of maintaining fire departments, may total another $8 billion per year. The prevention and control of fires is and must remain the responsibility of local authorities. But if the trend of growing fire losses is to be halted and reversed, the Federal Government must make a contribution in certain fields where only a national effort can provide the needed initiative and effort. This bill is aimed at filling that need.

EXPLANATION OF THE BILL

The need for improvement in all areas of fire prevention and control is evident. It is the intent of the bill to provide assistance in the reduction and prevention of fires and in the reduction of the losses resulting

[1] The Appendix contains an overview of America's fire problem.

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from fires. If enacted, the bill would set policies for Federal activities in this field and establish an agency to deal with fire safety matters.

Provisions of the Bill

Findings.—The Congress finds that the United States has the highest rates of death and property loss from fire of any industrial nation; that these losses are unacceptable; that while fire prevention and control is properly a local responsibility, the Federal Government can be of invaluable assistance; that both firefighting and civil defense programs can benefit from closer cooperation; that there is need for professional training for the fire services; that additional research is needed in the area of fire safety; that there is a need for a national fire data system; that the United States' facilities for the treatment and rehabilitation of burn victims are severely limited in number; and that the Federal Government's role in research, data, and training needs to be strengthened in order to improve the effectiveness of the Nation's firefighters.

Policy.—The United States' policy is declared to be: To reduce fire losses by better efforts at prevention and suppression; to supplement, not supplant, existing programs of research and training and to encourage new and improved programs by state and local agencies; to place the Federal responsibility for fire safety on the Secretary of Commerce; to encourage increasing cooperation between firefighting and civil defense forces; to carry out a program of public education in fire safety; to develop and provide for the use of new techniques in fire prevention and control; to establish a United States Fire Academy; to establish a fire data system; to increase research on burn treatment and to encourage the establishment of new burn treatment centers through the National Institutes of Health.

Title I

National Bureau of Fire Safety.—Title I of the bill establishes in the Department of Commerce a National Bureau of Fire Safety, the "Fire Bureau", headed by a presidentially appointed Director. The Fire Bureau shall be the Federal focus of efforts to improve the Nation's fire prevention and control. To this end, the Fire Bureau will undertake programs of technology development, training and education, data collection and analysis, public education, and other efforts, in cooperation with State and local governments, which continue to have the primary responsibility, and with the private sector. The Director is instructed to insure that results of the Bureau's work are widely available and to encourage their use where applicable. This last item recognizes the diffuseness and diversity of the fire community which makes transfer of technology and utilization of new information particularly difficult.

The activities to be included in the Fire Bureau are explained in the order they appear in the bill.

Public Education.—The Director is instructed to undertake a continuing and extensive program of public education in fire safety and fire prevention. It is the intent of the committee that this include pro-

grams in the schools, training for teachers, mass-media/public-service advertising, and educational materials. The bill provides that the Director shall collaborate with other organizations in this field and that the program shall include special messages targeted for particularly vulnerable groups, such as the young and the elderly. In recognition of the apathy which greets most current efforts in public education, the Director is instructed to conduct research into new methods of public education.

Fire Technology.—The Director shall develop new technology for fire safety to include both equipment and techniques. This section of the bill recognizes the need for new technology in fire protection and also recognizes that this must be *proven* technology. Because of the sporadic, surprise nature of fire incidents and because lives are at stake, equipment must function correctly the first time, often, as in the case of sprinklers, after long standby periods. Thus testing, evaluation, acceptance and validation test procedures, operation tests, demonstration projects, and actual fire investigations are included. Items of equipment to be covered by the program are: protective clothing; breathing apparatus; auxiliary equipment (e.g., communications); equipment for special fires or situations; fire detectors; sprinklers; fire alarms; etc. In the area of techniques the Director shall develop purchase specifications and standards for such equipment.

Further in the area of techniques, the Director shall conduct research on the management and operation of fire departments, on fire department productivity, and on fire service personnel needs and problems. This last item shall cover investigations into such questions as—What kind of skills should a modern department have? How can department policies insure that the right man gets into the right job? What new tactical approach to fighting fires or physical training program might reduce firefighter injuries? The thrust here is to develop techniques and guidelines to enable the fire chief to utilize his manpower and equipment resources effectively and efficiently.

Finally, the bill recognizes that there exists much under-utilized technology which could be adapted to fire protection and instructs the Director to take full advantage of this resource.

Fire Data.—The Director shall operate a comprehensive, integrated national fire data and information system. Three kinds of data and information are to be included in the comprehensive system: Statistical; practical; and technical. Statistical information on fires that have occurred includes causes, losses, injuries, means of suppression, route of fire spread, etc. Firefighter injuries are a particularly important category to be included. Practical information shall include, fire laws and codes, inspection practices, administrative structures, fire prevention techniques, etc. Technical information shall include, fire properties of materials, fire behavior and best method of control, etc. The integrated system shall collect data from all appropriate sources (e.g. fire departments, insurance organizations, medical facilities), combine and analyze it so that it delivers its message to the desired user, publish, and disseminate it. This last recognizes that there may be several user communities and that some of the small volunteer departments may be hard to reach. The data will be collected and analyzed so it can be

used to: (1) give an accurate measure of the size and character of the Nation's fire problem; (2) provide the basis for setting priorities—which problem should be attacked first; (3) indicate possible fruitful approaches to solving particular problems; and (4) monitor the progress of fire safety programs.

The Director is authorized to develop standardized fire data reporting methods to insure that reports from different jurisdictions are compatible, but the use of such standard reports is not made mandatory. The Director is, however, authorized to assist State, local and other agencies in developing and reporting information, and to make use of existing data capabilities as much as possible, so that he can thereby encourage the development of a sound, reliable data base.

United States Fire Academy.—The bill establishes a United States Fire Academy as part of the Fire Bureau, to be headed by a Superintendent appointed by and responsible to the Director. The provisions of the bill recognize that there exists in the United States an established system for fire training. This existing system now provides basic training for recruit firefighters, certain advanced training in special fires such as flammable liquids, and other types of training. However, the training available to firefighters varies across the Nation and there is little management training for fire chiefs. Thus the role of the Academy in supplementing the system is to fill the gaps where there is no activity, and to improve existing programs where necessary. To accomplish this, the Academy will have three separate activities: There will be courses of study given at Academy facilities; there will be correspondence courses offered by the Academy; and there will be assistance to existing and new local programs.

The several hearings before the Committee have emphasized the need to move ahead with new courses, new content, and new techniques. Therefore, the Academy has a responsibility to take the lead in achieving a greater professionalism among fire services and, where it would be an improvement, to break out of traditional approaches. Specifically, the Fire Technology program and the research program provided in the bill will each generate new information, techniques, software and hardware. The Academy will be the principal channel for introducing this new material into the practices of the fire services.

The list of areas and means of instruction in the bill is intended to give the Superintendent wide latitude in carrying out the program. To assist him in this the Superintendent is directed to conduct a continuing study of the training needs of the Nation's fire forces. This activity will provide him with the information he needs to insure that his program does fill gaps—i.e., supports, not supplants, existing programs. This continuing study will also inform him as to which local programs or which areas of training might need shoring up, and which courses should be offered or developed by the Academy.

Courses offered by the Academy would include techniques of fire inspection and fire and arson investigation; tactics and command for fire situations; the administration and management of fire departments; civil defense operations; courses for the training of instructors; and topics not offered elsewhere. Correspondence courses would be developed and offered in areas of need, where the topic can be handled in this way.

The Superintendent is authorized to assist existing local training programs and to encourage the development of new programs, where they are needed. Areas to be included in this support are vocational training in fire prevention, fire inspection, firefighting, and fire and arson investigation; fire training courses at junior colleges; and four-year degree programs in fire engineering at colleges and universities. This assistance would be rendered through curriculum development, development of texts or manuals, workshops for instructors, etc., and by paying students up to 75 percent of the cost of their attendance at Academy-approved courses at colleges and universities. These Academy-approved courses would be offered at institutions having background and experience in fire training. A number of such institutions exist including the University of Maryland, the University of Michigan and Texas A&M University.

As another kind of assistance to fire education, the Superintendent is also authorized to encourage professional schools of architecture, city planning, and engineering to include fire safety in their curricula. This would enable designers of buildings and products to understand the reasons for certain provisions in fire codes and the performance expected of their design.

The Academy proper shall consist of whatever buildings and special facilities, staff, and other personnel are necessary or appropriate for the Academy programs. The location of the Academy will be selected by the Secretary of Commerce after receiving a report from a Site Selection Board. This Board, the Superintendent plus two others, will consider such things as travel distance for students, environmental factors, etc. If found desirable the Academy may have more than a single site.

Because the existing training system is very diverse, the bill provides that the Superintendent shall establish a committee to study the issue of accreditation of fire training courses. Accreditation could result in more uniform standards of training. That is, a graduate of a certain accredited course could be expected to have certain skills and know certain facts. This committee would consider whether a mechanism of accreditation is desirable and what role the Academy should play. The committee is to report within a year after its formation and then ceases to exist.

Students in Academy courses and programs are to be selected from members of the fire services or civil defense forces, or other individuals that might be able to better contribute to reduction of fire losses with further training.

The bill provides that the Superintendent may establish fees for courses and may provide stipends to students, up to 75 percent of tuition, travel, and subsistence costs.

To encourage the growth of a cadre of trained fire professionals, the Superintendent is authorized to provide scholarships and make loans to full-time students in fire engineering courses.

The bill provides that a Board of Visitors be appointed by the Secretary of Commerce to review annually the Academy program and report to the Secretary. The membership of the Board should be broad enough to ensure that the Academy curriculum, etc., is examined from several points of view. The Board must assist the Academy in its leadership

function, in sorting out traditional approaches of proven value from traditional approaches which are merely routine and habitual, and which could be improved.

Reimbursement for Firefighting Costs.—The bill provides that a fire protection district or fire department may be reimbursed at least in part, for its costs incurred in fighting a fire on Federal property. To receive this reimbursement the district or department must file a report with the Director stating: (1) The losses or expenses incurred as a result of fighting the fire; and (2) the costs of operation of the district or department for the year preceding the incident and the year of the incident, and the estimated costs for the following year. Using this report the Director can determine the relative burden of a particular Federal fire incident. The Director shall then determine and make a payment to the fire district or fire department which shall represent their costs less a pro-rata share of Federal payments made in lieu of taxes. The Committee intends that, upon making such a payment, the Director will be reimbursed by the Federal agency on whose property the fire occurred.

Authorization.—$2,000,000 is authorized to carry out the activities of the Fire Bureau for Fiscal Year 1975.

Title II

Fire Research Center.—Title II of the bill establishes a Fire Research Center in the Department of Commerce which is intended to carry on the National Bureau of Standards fire program and which is to conduct basic and applied research on the phenomenon of fire in order to provide the information needed to develop new technology, better fire codes, etc. The activity shall have two parts: (1) A physical science program to include the physics and chemistry of fire and its effects. (2) A program on the effects of fire on humans to include biology, physiology, psychology.

The intent of the bill is to authorize the Fire Research Center to conduct laboratory or test investigations of fires, and whenever necessary to supplement these controlled investigations with field investigations of actual fires. The center is expected to compare laboratory results against real fire experience and to use real fire experience as a guide to further laboratory efforts. In addition it is expected that the analytical and testing capabilities of the Fire Research Center will be used to determine the cause of certain real fires, not on a routine basis, but whenever such determination will contribute to our knowledge of fire in general. The intent of the committee is that the laboratory program be kept relevant to real fire problems through direct fire observation and investigatory participation by the research staff.

The physical science program shall study such topics as fire dynamics, fire growth and spread, ignition, extinguishment, the early stages of fire (to improve early detection, i.e., to determine what characteristics of a new fire one should detect), and the behavior of fire in buildings. The program shall study unique fire hazards that arise from industrial use of dangerous materials including chemical fires. A very important part of the program is the determination of the products of combustion, including smoke, which account for most fire deaths.

Another part of the program shall study the design of buildings and other structures to generate design concepts enabling an architect or builder to incorporate fire safety into buildings that are comfortable, beautiful, economical, etc.

The human-effects program will investigate the effects of fire, smoke and heat on humans. The goal is to produce basic information on the actual mechanisms by which fire affects its victims so that buildings, products, materials, and procedures can be made safer. This must include research into the psychological and behavioral effects of fire and in this respect must consider the effects of fire on individuals and on groups in various types of situations. For example, basic information on human behavior is needed for the design of exits to make possible the safe evacuation of high-rise buildings. Further, the program must cover both the actual or potential fire victims, who perhaps are exposed to fire once in a lifetime, and the firefighter whose job requires repeated exposure to fire. Specific areas of research shall include: (1) The effects on humans of toxic substances produced by fires, e.g. smoke and other combustion products; (2) hazards and stresses caused by the exposure to the heat, smoke and danger of fire, especially as this applies to firefighters; (3) research for the development of simple tests to determine the cause of a fire victim's death (this recognizes the fact that many bodies are recovered badly burned, but may have been burned after dying from exposure to toxic smoke); (4) improved methods of first-aid for fire victims, simple treatments to be given at the scene of a fire; and (5) other studies (biological, physiological, and psychological) as necessary.

The bill also provides that the research program shall examine the psychological and motivational characteristics of arsonists. The purpose of this provision is to develop information to enable the prediction and cure of such behavior.

The bill instructs the Director to insure that the results of the research program are put to work improving fire safety. The principal means of applying the results named in the bill are codes, standards, and test methods. However, the Director should also insure that where appropriate research results are given to the U.S. Fire Academy, to other Federal agencies, to industry, and to State and local governments.

$3,500,000 is authorized to carry out the fire research program for the fiscal year ending 30 June 1975.

Section 204 makes changes in the Organic Act of the National Bureau of Standards. The effect of these changes is to insert sections 201 and 202 of this bill into the NBS Organic Act to describe the fire research program to be carried out at NBS. The intent is to insure that a strong, competent scientific program in fire research be carried out and managed by the National Bureau of Standards.

Title III

Victims of Fire.—Section 301 authorizes and directs the Secretary of Health, Education, and Welfare to establish in the National Institutes of Health a program of improved treatment and rehabilitation of burn victims. The bill provides for a broad program of research, training, and improved treatment.

The bill provides that NIH shall sponsor and encourage the establishment of three types of burn treatment activities: Twenty-five new "burn centers"; twenty-five new "burn units"; and ninety new "burn programs".

A "burn center" is a separate hospital facility having interrelated programs of research and teaching as well as patient care. The staff of a burn center would include general, orthopedic, and plastic surgeons; specially trained nurses and physical therapists; psychologists; psychiatrists; social workers and others who work together to treat and rehabilitate the victim. A "burn unit" is a less elaborate facility. It is a specialized facility in a general hospital used only for burn patients and staffed by burn specialists. Finally, a "burn program" is a staff of burn injury specialists without special facilities.

The National Institutes of Health is also directed to provide training and support for the treatment and rehabilitation specialists necessary to staff the activities described above; to provide training in emergency care for burn victims; to increase their sponsored research program on burns, burn treatment, and burn rehabilitation; to systematically study smoke inhalation injuries; and to sponsor and support other necessary research and training programs.

Fire Protection Loan Insurance.—This section of the bill amends the National Housing Act to make loans for the purchase and installation in nursing homes of fire safety equipment such as sprinklers eligible for loan insurance. The installed fire safety equipment must bring the nursing home into compliance with the Life Safety Code of the National Fire Protection Association as modified by the Secretary of Commerce. This is to ensure that the funds do bring greater safety to the occupants. This section provides that the fire safety loans are to be treated generally the same as home improvement loans which are insurable under the National Housing Act. However, there are several specific provisions in the bill which determine the eligibility for loan insurance. These are: (1) The principal may not exceed $50,000. (2) The interest may not exceed a rate prescribed by the Secretary of HUD. (3) The loan must mature within an acceptable period, but in no case shall the loan continue for more than twelve years. (4) The loan must comply with such other terms, conditions, etc., as the Secretary of Housing and Urban Development may prescribe after consulting with the Secretary of Commerce. The consultation with the Secretary of Commerce is intended to insure that the loans are used for modern, effective safety equipment, that is, this consultation provides means whereby research results and technical information developed at the National Bureau of Fire Safety or the National Bureau of Standards can be applied to nursing home fire safety.

Additional Explanation

Fire Loss Prevention.—The dominant theme throughout the report of the National Commission is that fire *prevention*, or perhaps better fire *loss* prevention, has been relatively neglected and needs more support. The bill intends to insure this. Prevention is emphasized throughout the language of the bill. This is not to deprecate the efforts and

courage of firefighters battling a large fire, but only to emphasize that when a building is fully involved in fire, much loss has already occurred. Such efforts by firefighters effectively prevent the spread of fire from building to building—indeed major conflagrations in U.S. cities are now rare. The next step in reducing fire loss must come from preventing fires, and from automatically detecting and supressing them while they are small.

The intent of the bill is to reduce indirect fire costs such as costs of operating fire departments by providing for better management techniques. Finally, the bill should cover activities to reduce fire *loss*, even if these activities do not directly reduce fires. For example certain standards on exits reduce potential fire losses but do not reduce the incidence of fire.

Organizational Arrangements.—The bill provides for a new organization in the Department of Commerce, the National Bureau of Fire Safety, and at the same time redefines the role of the National Bureau of Standards in fire research. Clearly, the two programs must work together and it is intended and assumed by the Committee that coordination will be assured by having the NBFS with NBS under the Assistant Secretary of Commerce for Science and Technology. It is intended that the NBS research effort support the more operationally-oriented NBFS. However, the research effort should not be totally bound to support of on-going efforts. There are needs for major advances in fire science and technology which can only be made if the research program is free to explore new areas. For this reason and also because it would be difficult, expensive, and slow to duplicate the NBS physical science capabilities, the intent of the Committee is that there be a separately funded and managed fire research program at NBS. The language of the bill clearly defines the field of responsibility of each agency: The National Bureau of Fire Safety is responsible for public education, the U.S. Fire Academy, information and data, and technology development and validation. The NBFS is the national focus for the Nation's fire problem with a comprehensive program to reduce life and property loss from fire as recommended by the National Commission. The Bureau of Standards is responsible for studying and elucidating the physical and chemical phenomena of fire, and the effects of fire on humans. If areas of overlap or gaps should develop, such problems should be resolved by the Assistant Secretary.

Relation to Standards Writing Bodies.—Several private organizations are now active, to varying degrees, in writing or developing standards related to fires. Among these are the Factory Mutual group, Underwriter's Laboratory, the American Society for Testing and Materials, and the National Fire Protection Association. There are also groups developing model building codes which contain many fire-related provisions. It is not intended that the NBFS replace or compete with these bodies, rather that the NBFS and NBS generate and contribute the hard technical information needed to write good standards. It is expected that NBFS staff will participate in the voluntary consensus procedures of the organizations named above and others just as NBS staff have done in the past.

In section 302, the bill provides that loans to install fire safety equipment in nursing homes may be insured, provided the equipment is necessary to bring the home into compliance with the NFPA Life Safety Code ". . . as modified in accordance with evaluation by the Secretary of Commerce. . .". This language is intended to ensure that up-to-date standards and codes are always used. If the NFPA code falls behind best practice, it should be modified. Such possible modification of loan-insurance criteria will provide an incentive for the NFPA to keep its code up to date. Otherwise, local jurisdictions will tend to refer to the as-modified code, bypassing NFPA.

Explosions and Chemical Fires.—There has been confusion in some standards-writing bodies as to whether or not an "explosion" is a "fire". Some explosions clearly are not fires: a compressed air tank may rupture loudly, violently, and suddenly—explode—with no fire or other chemical reaction. Clearly such an event in itself is not a fire and the attendant problems do not fall under the provisions of this act. Such an event might be attended by a Fire Department because of either secondary fires, or injuries, or threat of secondary fire caused by the rupture. On the other hand, many explosions are in fact very rapid fires: An "explosion" of gasoline fumes is an example. Such combustion explosions and their attendant problems do fall under the provisions of this act.

Another area of ambiguity is "chemical fires". One normally thinks of fire as a rapid combination of fuel and oxygen with the consequent evolution of heat and light. However, there can be rapid chemical reactions not involving oxygen which have all the appearances and problems (e.g. toxic smoke) of oxygen fire. There are also chemicals which react violently with water. Clearly when dealing with such reactive chemicals a fire department must be well informed and trained. For this reason, it is intended that chemical fires and reactive chemical events and the attendant problems should fall under the provisions of the bill.

Rescue Operations.—Many fire departments operate rescue and ambulance services which attend incidents not related to fires. This is a common-sense arrangement to take advantage of the facts that (1) firemen must be trained for and capable of handling fire victims and (2) they are well located and equipped to respond to emergency calls. The programs provided for in the bill should take the same approach. That is, the main thrust should be fire operations but, for example, an Academy course in fire department management should deal with the fact that many fire chiefs will also be managing a rescue operation. On the other hand, while it is recognized that fire departments might respond to accidents to remove trapped victims, there should be no research on safety unrelated to fire under the provisions of this bill.

Civil Defense.—In several places the bill provides for cooperation between Federal efforts in fire and in civil defense. A special example is in training. The U.S. Fire Academy should cooperate and coordinate closely with the Civil Defense College in Battle Creek, Michigan. In many areas the local fire chief is the civil defense director. The academy curriculum should recognize this fact.

Fire Protection Districts.—The Committee intends that the term "fire department" wherever it appears in the bill or this report include

fire protection districts or any other recognized firefighting organizations.

The United States Fire Academy.—The Committee gave careful consideration to the need for a central, national educational facility to serve the fire community. As part of this consideration a delegation from the Committee visited the Fire Services Technical College in England. This outstanding facility, located in Moreton-in-Marsh, was constructed within the last five years and is probably the world's outstanding fire services educational and training facility. The operation of the FBI Academy located at Quantico, Virginia was also reviewed, and its contribution to the training of Federal, State, and local law enforcement officers evaluated. The Committee reached the conclusion that such a central education and training facility for the fire services can contribute immeasurably to raising the technical and professional standards of the fire services throughout the country. It is the intent of the bill that a site for the Academy be selected and the Academy established forthwith.

LEGISLATIVE HISTORY

The Committee on Science and Astronautics has had a continuing interest in fire prevention and control. This stems from the Committee's jurisdiction over the National Bureau of Standards which since 1914, has performed distinguished work on building materials and the fire properties of such materials.

The Fire Research and Safety Act.—The Fire Research and Safety Act of 1968 (Public Law 90–259), which was reported out by the Committee after extensive hearings, established a comprehensive program of fire research at the National Bureau of Standards and at the same time set up a National Commission of Fire Protection and Control ". . . to undertake a thorough study of this [fire] problem with a view to the formulation of recommendations. . . ".

NBS was authorized to carry out investigations of fires; research into the causes and nature of fires; development of improved methods of fire prevention, fire control, and fire loss prevention; educational programs in fire safety; fire information reference services; fire service training programs; demonstration projects; and the development of fire protection and fire safety curricula.

1972 Hearings.—In 1972 Congressman Steele of Connecticut introduced seven bills pertaining to fire which were referred to this Committee. The bills would have: (1) Created a Fire Academy; (2) made grants to local authorities to pay for one-half the cost of firefighter training; (3) made grants to colleges to pay for one-half the cost of fire science programs; (4) provided financial aid to fire departments for the purchase of advanced firefighting equipment; (5) provided financial aid to fire departments for the purchase of protective equipment; (6) authorized three additional years of funding for the Fire Research and Safety Act of 1968; and (7) established a Fire Data clearinghouse. Hearings were held 10 and 11 October, 1972. Witnesses included: Congressman Robert H. Steele, Barry M. Goldwater, Jr., and John H. Rousselot; the Vice Chairman of the Commission, W. H. McClennan; representatives of the fire services; Johnnie L. Cald-

well, Georgia State Fire Safety Commissioner; and representatives of NBS. The witnesses generally supported the concepts contained in the Steele Bills. In early 1973 as a result of these hearings Mr. John W. Davis, Chairman of the Subcommittee on Science, Research and Development, introduced H.R. 5589 which would have amended the NBS organic act to broaden its activities in the field of fire research.

The National Commission Report.—The Commission authorized in the 1968 Act was organized and began its work in 1971. Hearings were held in several major cities across the United States. The Commission issued its report, *America Burning*, in May, 1973, fulfilling the provisions of Title II of the Fire Research and Safety Act of 1968. The Commission made some ninety recommendations, and the first was to establish an organization ". . . to provide a national focus for the Nation's fire problems and to promote a comprehensive program with adequate funding to reduce life and property loss from fire".

As found by the Commission the major aspects of the Nation's fire problem are:

1. There needs to be more emphasis on fire prevention.
2. The fire services need better training and education.
3. Americans must be educated about fire safety.
4. In both design and materials, the environment in which Americans live and work presents unnecessary hazards.
5. The fire protection features of buildings need to be improved.
6. Important areas of research are being neglected.

1973 Hearings.—A great deal of awareness of fire and the need for Federal action was generated in 1973 by the Commission's report and by several spectacular fires. As a result over eighty fire-related bills were introduced in the First Session of the 93rd Congress and referred to the Committee. Among these were H.R. 109, 110, 111, 112, 113, 114 and 115, introduced by Mr. Steele which had the same purposes as his earlier bills described above; H.R. 5589, introduced by Mr. Davis, to amend the NBS organic act; and H.R. 7508, introduced by Mr. Symington which would have assisted local fire protection districts to maintain and improve their firefighting and rescue operations. H.R. 7681, introduced by Mr. Patman on behalf of the National Fire Commission, would have established a U.S. Fire Administration and a Fire Academy, assisted State and local governments to reduce fire loss, and increased coordination of fire prevention and control efforts at all levels of government.

Five days of hearings were held on July 25, 26, 31, and August 1, 2, 1973, to consider the bills before the Committee and the Commission report. Witnesses included: Congressmen Robert H. Steele, Jerry Pettis and Lester L. Wolff; Richard Bland, Chairman of the National Commission on Fire Prevention and Control; three representatives of the uniformed fire services, including W. H. McClennan, President of the International Association of Firefighters, who had served as Vice Chairman of the National Commission; two representatives of fire training organizations; two physicians interested in burns; representatives of the insurance industry and the National Fire Protection Association; and representatives of the Departments of Com-

merce and Housing and Urban Development. An additional 19 members of Congress submitted statements for the record, and thirty other individuals and representatives of local government, educators, industries and trade associations also submitted statements for the record. The hearings have been published under the title "Fire Prevention and Control".

Legislation to define a new Federal role in fire prevention and control was drafted pursuant to the hearings and the Subcommittee on Science, Research and Development met in a mark-up session on December 11, 1973, and reported out the Fire Prevention and Control Act of 1974. Subsequently the full Committee met on December 19, 1973, and unanimously ordered the bill, H.R. 11989, reported.

SECTIONAL ANALYSIS OF THE BILL

SECTION 1

The title of the bill is the "Fire Prevention and Control Act of 1974."

SECTION 2

Findings:

(1) The United States today has the highest rates of death and property loss due to fire of all major industrial nations.

(2) United States rates of fire loss are unacceptable.

(3) While fire is and should remain a local responsibility, the Federal Government can be of invaluable assistance in achieving reduced fire losses.

(4) Local fire and civil defense programs can benefit from closer cooperation.

(5) There is a need for professional training to improve fire department effectiveness.

(6) There is a need for more research on firefighting and fire protection.

(7) There is a need for data about fire losses in order to establish priorities.

(8) The number of specialized medical facilities for the treatment of burns in the United States is severely limited.

(9) To increase the effectiveness of our firefighting forces the Federal Government's role in fire research and development, data collection, and training must be strengthened.

SECTION 3

United States policy is declared to be:

(1) To reduce fire losses by better prevention and suppression.

(2) To supplement, not supplant, existing programs of research and training, and to encourage new and improved local programs in these areas.

(3) To place the Federal responsibility on the Secretary of Commerce.

(4) To encourage cooperation between fire and civil defense forces.

(5) To conduct a program of public education in fire safety.

(6) To develop and encourage the use of improved techniques for fire safety.

(7) To establish a United States Fire Academy.

(8) To establish an integrated and comprehensive fire data system.

(9) To conduct through the National Institutes of Health a program of research in burn treatment and rehabilitation.

TITLE I

SECTION 101

Establishes a National Bureau of Fire Safety within the Department of Commerce (the "Bureau").

SECTION 102

The Bureau to be headed by a Director appointed by the President.

SECTION 103

(a) The Bureau's function shall be to improve the Nation's efforts in fire prevention and control through programs of technology development, public education, training, and data collection and analysis.

(b) The Director shall ensure that the results of the Bureau's work are disseminated and shall encourage their use.

SECTION 104

The Director shall undertake a program of public education for fire safety.

SECTION 105

(a) The Director shall conduct a program of testing and development of fire-related equipment including—

(1) protective clothing,
(2) breathing apparatus,
(3) auxiliary equipment,
(4) equipment for special fires,
(5) fire detectors,
(6) fire suppression systems,
(7) methods of testing alarms, etc.
(8) purchase specifications and test methods,
(9) demonstrations and fire investigations, and
(10) other appropriate activities.

(b) The Director shall not manufacture or sell any device except as necessary to test or evaluate it.

(c) The Director shall conduct research on fire department operations and management.

(d) The Director shall conduct research on fire department personnel problems and needs.

(e) In conducting the program under this section the Director shall take advantage of existing technology.

SECTION 106

(a) The Director shall operate an integrated comprehensive national program of collecting, analyzing and publishing fire data. The program shall include:

(1) data on fire incidents,
(2) data on deaths and injuries,
(3) information on hazards of firefighting,
(4) information on fire prevention activities,
(5) technical information,
(6) laws, regulations, and techniques used in foreign countries,
(7) technical information (causes, behavior, method of control) on other types of fires (e.g., brush fires),
(8) other data and information.

(b) The Director may develop standardized reporting methods and encourage and assist local agencies in gathering the data.

(c) The Director may make full use of existing data gathering efforts.

(d) The Director shall make the data widely available.

SECTION 107

(a) Establishes a United States Fire Academy as part of the National Bureau of Fire Safety.

(b) The Academy to be headed by a Superintendent.

(c) The Academy to have the necessary buildings, facilities and staff.

SECTION 108

The Academy site shall be selected by the Secretary—

(a) based on recommendations of a Site Selection Board which shall

(b) give consideration to needs, accessibility, environmental effects, etc.

SECTION 109

The Superintendent is authorized to—

(a) conduct courses in—

(1) techniques in fire prevention, inspection, suppression, and investigation,
(2) tactics and command,
(3) administration and management,
(4) other subjects including civil defense,
(5) training of instructors,

(b) develop and offer a program of correspondence courses,

(c) encourage local training programs by supplementing and supporting—

(1) vocational training,
(2) courses at junior colleges,
(3) four-year degree programs in fire engineering,

(d) provide stipends, up to 75 percent of cost, for students attending academy-approved courses given at other institutions, and

(e) encourage the inclusion of fire safety considerations in the training programs of architects, builders, etc.

SECTION 110

The Superintendent shall continually assess the training needs of the Nation's fire forces.

SECTION 111

The Superintendent shall establish a Committee on Fire Training and Education to study and report on the question of accreditation of fire training courses.

SECTION 112

The Superintendent shall admit to Academy courses fire service and other appropriate personnel.

SECTION 113

The Superintendent may establish fees for Academy courses.

SECTION 114

The Superintendent may reimburse students up to 75 percent of the cost of attendance at Academy courses.

SECTION 115

The Superintendent may provide scholarships to full-time students in certain fire engineering courses.

SECTION 116

The Superintendent may make loans, up to $2,500 per year, to students enrolled in recognized fire engineering courses.

SECTION 117

The Superintendent may conduct short courses, workshops, etc.

SECTION 118

A Board of Visitors, appointed by the Secretary of Commerce, shall review the program of the Academy and make recommendations to the Secretary.

SECTION 119

(a) Each fire department which fights a fire on Federal property may file a report stating the costs of fighting the fire in relation to normal operating expenses.

(b) On receipt of such report the Director shall pay the costs of fighting the fire as determined by him less payments made for fire protection in lieu of taxes.

SECTION 120

Authorizes $2,000,000 for purposes of this Title for fiscal year 1975.

TITLE II

SECTION 201

(a) Establishes a Fire Research Center in the Department of Commerce to provide the scientific and technical information needed to reduce fire losses.

(b) The Center shall investigate all aspects of fire including—

(1) the physics and chemistry of fire;

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

(3) the composition of combustion products (smoke);

(4) the early stages of all kinds of fires to improve early detection capability;

(5) the behavior of all kinds of fires;

(6) unique fire hazards of transporting and using combustible materials;

(7) building design for increased fire safety consistent with other building performance factors; and

(8) other aspects as deemed useful.

(c) The Center shall investigate the biological, physiological and psychological effects of fire on victims and fire-fighters. The program shall include—

(1) the effects of toxic substances in smoke;

(2) hazards resulting from exposure to fire;

(3) development of simple tests for determining the cause of death;

(4) improved first aid for fire victims;

(5) the psychology of arsonists;

(6) the stresses encountered by firefighters, their effects and alleviations; and

(7) other physiological effects of fire.

SECTION 202

The Director shall ensure that the results of the Center's work are disseminated and shall encourage their use in fire codes, test methods, and standards.

SECTION 203

Authorizes $3,500,000 for this title for fiscal year 1975.

SECTION 204

Replaces sections 16 and 17 of the NBS Organic Act (which deal with fire research) with sections 201 and 202 of this Act.

Title III

SECTION 301

(a) Authorizes and directs the Secretary of HEW to establish an expanded research program on burns, treatment, and rehabilitation in the National Institutes of Health. NIH shall—

(1) sponsor and encourage 25 new burn treatment centers, and 25 new burn units,

(2) train and support specialists to staff the centers and units,

(3) sponsor and encourage 90 burn programs in general hospitals,

(4) provide training in first aid for burns,

(5) increase research on burns,

(6) administer and support research on smoke inhalation,

(7) support other burn research and training programs.

(b) Authorizes $2,000,000 for this Title for fiscal year 1975.

SECTION 302

Amends section 232 of the National Housing Act by adding subsection (i):

(i) (1) The Secretary of Housing and Urban Development may insure loans to nursing homes to purchase and install fire safety equipment needed to bring the home up to certain standards.

(2) An eligible loan must

(A) not exceed $50,000;

(B) not exceed a prescribed interest rate;

(C) have a maturity satisfactory to the Secretary of HUD; and

(D) comply with other conditions as prescribed.

(3) Such loans to be considered home improvement loans for purposes of the act.

(4) Other provisions of the National Housing Act apply to these loans.

Title IV

SECTION 401

Defines "State" to include D.C., Puerto Rico, the Virgin Islands, Guam, the Canal Zone, American Samoa and the Trust Territory of the Pacific Islands.

SECTION 402

Allows the Secretary or the Comptroller General access to documents for purposes of audit.

SECTION 403

Makes the President's Statement of Government Patent Policy issued 23 August 1971 applicable to inventions made pursuant to this Act.

COST AND BUDGET DATA

Based on the Commission report and the Committee's own inquiries, the following cost and budget estimates are provided for the activities contemplated in the bill. The Commerce Department budget shown for FY 1974 is the current budget for the National Bureau of Standards program under the Fire Research and Safety Act of 1968.

Department of Commerce (titles I, II):	
Fiscal year 1974	$4.0
Fiscal year 1975	5.5
Fiscal year 1976	15.0
Fiscal year 1977	20.0
Fiscal year 1978	20.0
Fiscal year 1979	20.0
National Institutes of Health, (title III):	
Fiscal year 1974	0
Fiscal year 1975	2.0
Fiscal year 1976	3.5
Fiscal year 1977	5.0
Fiscal year 1978	5.5
Fiscal year 1979	5.5

The loan insurance program is expected to be self-supporting.

COMMITTEE RECOMMENDATIONS

A quorum being present, the Committee favorably reported the bill without amendment and recommends its enactment.

DEPARTMENT RECOMMENDATION

Communications received from Federal departments in respect to the bill H.R. 11989 are as follows:

GENERAL COUNSEL OF THE DEPARTMENT OF COMMERCE,
Washington, D.C., January 23, 1974.

Hon. OLIN E. TEAGUE,
Chairman, Committee on Science and Astronautics, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This letter is in response to your request for our views and recommendations with respect to H.R. 11989, a bill "To enhance the public health and safety by reducing the human and material losses resulting from fires through better fire prevention and control, and for other purposes."

We are pleased to note that H.R. 11989 incorporates in large measure the three important functions which we believe necessary for a comprehensive national fire prevention program. These functions, which are included in the Administration's fire proposal, H.R. 10913, are a training and education program, including a public awareness effort, a national system of fire data and information, and a research and development program.

It is noted, however, that the bill in several places does not follow the organizational concept of Reorganization Plan No. 5 of 1950 (64 Stat. 1263) which vests all functions of the Department of Commerce

in the Secretary of Commerce. The concept set out in Reorganization Plan No. 5 put into effect the recommendation of the first Hoover Commission on Organization that "the heads of Departments must hold full responsibility for the conduct of their departments." (See House of Representatives Document #504, 81st Congress, 2d Session, which sets out President Truman's general message which accompanied the transmittal of Reorganization Plan No. 5 to the Congress.)

We believe that this organizational concept can best be included in H.R. 11989 by inserting the following provision:

> "The Secretary of Commerce may vest in himself all functions set out in this Act and may from time to time authorize their performance by any officer or employee of the Department of Commerce."

We are concerned, however, that Section 201, Title II, Fire Research Center, appears to create a separate organizational element in Commerce (i.e., a Fire Research Center which is not part of the National Bureau of Fire Safety). To clarify this and maintain flexibility we urge that the words in the first sentence of Section 201 "There is hereby established" be deleted and the words "The Secretary of Commerce is authorized to establish" be substituted therefor.

We note that the bill provides specific authorization for each fiscal year. We strongly believe that the type of program proposed by this legislation should have the flexibility to meet the annual requirements of the program rather than requiring modification of the underlying authorization each year. Accordingly, we urge that the specific authorization language be deleted from the bill and the following substituted therefor:

> "There are hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act. Appropriations to carry out the provisions of this Act may remain available for obligation and expenditure for such period or periods as may be specified in the Acts making such appropriations."

We defer to HEW on Section 301.

In sum, except for our comment expressed above, this Department supports fully H.R. 11989, the "Fire Prevention and Control Act of 1974."

We have been advised by the Office of Management and Budget that there will be no objection to the submission of our report to the Congress from the standpoint of the Administration's program.

Sincerely,

KARL E. BAKKE,
General Counsel.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of the rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

Fire Research and Safety Act of 1968

[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 8, 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 non-profit 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 regula-

tions 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.”

[NONINTERFERENCE WITH EXISTING FEDERAL PROGRAMS

[SEC. 103. Nothing contained in this title shall be deemed to repeal, supersede, or diminish existing authority or responsibility of any agency or instrumentality of the Federal Government.

[AUTHORIZATION OF APPROPRIATIONS

[SEC. 104. There are authorized to be appropriated, for the purposes of this Act, $5,000,000 for the period ending June 30, 1970.]

* * * * * * *

SECTIONS 16 AND 17 OF THE ACT OF MARCH 3, 1901

[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 of 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.]

Sec. 16. (a) There is hereby established within the Department of Commerce a Fire Research Center (hereinafter referred to as the "Center") which shall have the mission of performing and supporting basic and applied research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and reduction of fires.

(b) The Center shall conduct directly or through contracts or grants a program of basic and applied fire research aimed at arriving at an understanding of the fundamental processes underlying all aspects of fire. Such program shall include scientific and field investigations of—

(1) the physics and chemistry of combustion processes;

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

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

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

(5) the behavior of fire 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, fires underground, oil blowout fires, brush fires, and waterborne fires);

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

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

(8) such other aspects of the fire process as are deemed useful for pursuing the mission of the fire research program.

(c) The Center shall conduct directly or through contracts or grants research into the biological, physiological, and psychological factors affecting the human victims of fires and the performance of the individual members of fire protection forces. Such research shall include—

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

(2) the trauma, cardiac conditions, and other hazards resulting from exposure to fires;

(3) the development of simple, reliable tests for the determination of the cause of death from fires;

(4) improved methods of providing first aid to the victims of fires;

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

(6) the conditions of stress encountered by firefighters, their effects, and their alleviation or reduction;

(7) Such other biological, physiological, and psychological effects of fire as may have significance for purposes of this section.

Sec. 17. The Director shall insure that the results and advances arising from the work of the Center are disseminated and encourage the incorporation of these results and advances into the relevant building codes, fire codes, model codes, and other relevant codes, test methods, and standards. The Director 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.

SECTION 232 OF THE NATIONAL HOUSING ACT

MORTGAGE INSURANCE FOR NURSING HOMES

SEC. 232. (a) * * *

* * * * * * *

(i) (1) The Secretary is authorized upon such terms and conditions as he may prescribe to make commitments to insure loans made by financial institutions to nursing homes and intermediate care facilities to provide for the purchase and installation of fire safety equipment necessary for compliance with the 1969 edition of the Life Safety Code of the National Fire Protection Association, as modified in accordance with evaluation by the Secretary of Commerce under the Fire Prevention and Control Act of 1974 or which are recognized by the Secretary of Health, Education, and Welfare as conditions of participation for providers of services under title XVIII and title XIX of the Social Security Act, as modified in accordance with evaluations by the Secretary of Commerce under such Act.

(2) To be eligible for insurance under this subsection a loan shall—

(A) have a principal amount not to exceed $50,000;

(B) bear interest at a rate not to exceed the rate prescribed by the Secretary;

(C) have a maturity satisfactory to the Secretary, but not to exceed twelve years from the beginning of the amortization of the loan or three-quarters of the remaining economic life of the structure in which the equipment is to be installed, whichever is less; and

(D) comply with other such terms, conditions, and restrictions as the Secretary, in consultation with the Secretary of Commerce, may prescribe.

(3) The provisions of paragraphs (5), (6), (7), (9), and (10) of section 220(h) shall be applicable to loans insured under this subsection, except that all references to "home improvement loans" shall be construed to refer to loans under this subsection.

(4) The provisions of subsections (c), (d), and (h) of section 2 shall apply to loans insured under this subsection, and for the purpose of this subsection references in such subsections to "this section" or "this title" shall be construed to refer to this subsection.

Appendix

THE NATION'S FIRE PROBLEM

Important and fundamental background information can be found in "America Burning", the report of the National Commission on Fire Prevention and Control. Chapter One of that report is entitled "The Nation's Fire Problem" and summarizes the challenge which this bill meets. It is reproduced here in part:

Fire! Hundreds of thousands of times a year, that shout reverberates down hallways or the inner recesses of the mind as Americans come face to face with one of the most dreaded causes of death and disfigurement. Ironically, for every American who will confront flames or choking smoke this year, there are hundreds who give the threat of fire not a moment's thought, who will continue to take only the slightest precautions to guard against fire.

Fire is a major national problem. During the next hour there is a statistical likelihood that more than 300 destructive fires will rage somewhere in this Nation. When they are extinguished, more than $300,000 worth of property will have been ruined. At least one person will have died. Thirty-four will be injured, some of them crippled or disfigured for life.

Annually, fire claims nearly 12,000 lives in the United States. Among causes of accidental death, only motor vehicle accidents and falls rank higher. Most of fire victims die by inhaling smoke or toxic gases well before the flames have reached them.

The scars and terrifying memories live on with the 300,000 Americans who are injured by fire every year. Of these, nearly 50,000 lie in hospitals for a period ranging from 6 weeks to 2 years. Many of them must return, over and over again, for plastic and reconstructive surgery. Many never resume normal lives.

The price of destructive fire in the United States amounts, by conservative estimate, to at least $11.4 billion a year (see Table 1–1). Beyond calculation are the losses from businesses that must close and from jobs that are interrupted or destroyed.

Table 1–1.—*Estimated annual U.S. fire costs*

Property loss	$2, 700, 000, 000
Fire department operations	2, 500, 000, 000
Burn injury treatment	1, 000, 000, 000
Operating cost of insurance industry	1, 900, 000, 000
Productivity loss	3, 300, 000, 000
Total	11, 400, 000, 000

In an America that has only lately grown conscious of its ecological responsibilities, there is a need also to develop an awareness of fire's role as one of the greatest wasters of our natural resources.

Appallingly, the richest and most technologically advanced nation in the world leads all the major industrialized countries in per capita deaths and property loss from fire. While differing reporting procedures make international comparisons unreliable, the fact that the United States reports a deaths-per-million-population rate nearly twice that of second-ranking Canada (57.1 versus 29.7) leaves little doubt that this Nation leads the other industrialized nations in fire deaths per capita. Similarly, in the category of economic loss per capita, the United States exceeds Canada by one-third.

Among those paying most heavily for this poor record are the Nation's firefighters. Theirs is the most hazardous profession of all. Their death rate is 15 percent greater than the next most dangerous occupations, mining and quarrying. In 1971, the injury rate for firefighters was 39.6 per 100 men—far higher than that of any other profession. That same year, 175 firefighters died in the line of duty; an additional 89 died of heart attacks and 26 are known to have died of lung disease contributed to by the routine smoke hazard of their occupation.

While many firefighters, particularly in smaller departments, do not have adequate opportunities for training, the fact is that the best training available does not obliterate the risks that firefighters must take in the line of duty. Every fire is a gamble with the unknown, a venture into a unique complex of combustible materials and fire dynamics.

Risk substitutes for certainty, intuition for firm knowledge. As the Committee on Fire Research of the National Research Council pointed out in 1959, "growth in our knowledge of how to cope with fire has not kept pace" with the growth of the fire problem. This basic force of nature has attracted little interest in the scientific community, and its elementary characteristics remain mysteries. To cite an unanswered practical question, posed in the Committee's 1969 report: "When should the top of a building be opened by firefighters to minimize spread; when does opening it increase the spread?" Every fire chief, of course, has to answer that question many times at many fire scenes, based on his training and experience. But little fundamental research has been performed to make one chief's answer better informed than another's.

America's poor fire record, and its failure to marshal enough scientific and monetary resources to improve the record, concerns those who work in the field of fire protection. Firefighters, individually and through such organizations as the International Association of Fire Fighters and the International Association of Fire Chiefs, have been outspoken on

the need to improve fire protection. The insurance industry, fire equipment manufacturers, fire research scientists, code officials, government administrators: Each of these groups has sought to improve the Nation's performance in combating the fire problem. For three-quarters of a century, the National Fire Protection Association, representing a variety of interests, has compiled an excellent record in public education and in the setting of standards for fire safety.

CAUSES OF AMERICA'S FIRE PROBLEM

The efforts of individuals and organizations in the fire protection field have run against the twin tides of ignorance and indifference—tides which contribute substantially to the extraordinary magnitude of the fire problem in the United States.

While genuine economic problems often stand in the way of deeper investment in fire protection, lack of understanding of fire's threat helps to account for the low priority given fire protection. And while those who have survived a fire never forget its destructive potential, for most Americans fire appears a remote danger that justifies indifference.

But indifference exists where it is least excusable. For example, there are those in the fire services who are unaware of the technological state-of-the-art in their field. There are fire department administrators who pay lip service to fire prevention and then do little to promote it. The public shares their unconcern, for in the public's image—an image which firefighters share—the fire department is a heroic-proportioned battalion of people rescuers and fire suppressers, not a professional corps of fire preventers.

Designers of buildings generally give minimal attention to fire safety in the buildings they design. They are content, as are their clients, to meet the minimal safety standards of the local building code. Often both assume that the codes provide completely adequate measures rather than minimal ones. In other instances, building owners and occupants see fire as something which will never happen to them, as a risk they will tolerate because fire prevention measures can be costly, or as a risk adequately balanced by the provisions of a fire insurance policy. Product designers, too, give little thought to possible toxic or fire-aggravating effects should their products become involved in a fire.

The Federal Government also has been largely indifferent to the fire problem. The Federal programs that exist (some of which are excellent) touch only small portions of the total fire problem.

Lastly, the American public is indifferent to and ignorant of the heavy toll of destructive fire. The problem has not reached the American consciousness with the same force as, for example, the far less lethal problem of air pollution. In contrast, poliomyelitis, which in the peak year of 1952 killed about as third as many people as died by fire in that year, has

been virtually eradicated because of the public attention it received. Moved by the sight of crippled children, Americans dug into their pockets to support research and control programs to attack the polio problem. Little concern has come forth regarding the grave losses to the Nation by fire.

Indifferent to fire as a national problem, Americans are similarly careless about fire as a personal threat. There is an old saying in the fire protection field to the effect that fires have three causes: men, women, and children. It takes the careless or unwise action of a human being, in most cases, to begin a destructive fire. In their home environments, Americans live their daily lives amid flammable materials close to potential sources of ignition. Though Americans are aroused to issues of safety in consumer products, fire safety is not one of their prime concerns. Few private homes have fire extinquishers, much less fire detection systems. Too few multiple-family dwellings and institutions have automatic equipment for extinguishing fires. And often when fire strikes, ignorance of what to do leads to panic behavior and aggravation of the hazards, rather than to successful escape.

Fire accidents due to carelessness occupy a vast middle portion of the spectrum of man-caused fires. At one end of the spectrum are the fires that are caused by the relatively helpless in our society—the very young, the old, and the handicapped. At the other end of the spectrum are the fires set deliberately.

The death rate from fire among children under 5 and the elderly over 65 is three times that of the rest of the population. Though together these young and old make up only 20 percent of the American population, they account for 45 percent of the fire deaths.

In contrast to the fire accidents difficult to prevent are the fires set on purpose. In 1971, among fires reported to the National Fire Protection Association, about 7 percent were classified as incendiary; an additional 17 percent were "of unknown origin." Arsonists pick expensive targets: Among the 1971 fires in which losses exceeded $250,000, 27 percent were classified as incendiary, another 47 percent as of unknown origin. In many large cities, fire chiefs believe that almost half of all fires in their experience have been deliberately set.

Fire has always held an attraction for demented thrill-seekers. That fire is a way of attacking authority is indicated by the fact that in 1971 26 percent of the large-loss school fires and 44 percent of the large-loss church fires were incendiary.

First cousin to the maliciously set fire is the false alarm. In large cities, it is not uncommon for false alarms to constitute 20 to 30 percent of all calls for service (excluding ambulance requests). In Boston false alarms in 1972 occurred on the average of one every 45 minutes.

Not all deliberately set fires stem from malice or thrill-seeking; an increasing number are set for profit. A number of building owners have been setting their properties afire to reap insurance benefits and tax write-offs in excess of

market value, delinquent taxes, or demolition costs. In the troubled city of Newark, N.J., where the number of vacated buildings increased by 300 percent between 1965 and 1971, the number of fires in these structures increased by over 500 percent. There is evidence that the Fair Access to Insurance Requirements (FAIR) plan, designed to provide insurance on properties not qualified under normal company standards, is being used by some owners of deteriorating buildings to burn for profit.

SOCIAL CHANGES AFFECTING THE FIRE PROBLEM

That there is not an all-out war against arson and false alarm again reflects national indifference toward destructive fire. Partly because of this national indifference, and partly because rapid changes in American society have created other problems, our approaches to the fire problem are not adequate to meet the needs of today. They suffer what anthropologists call "cultural lag". our methods of handling the fire problem are attuned to the America of yesteryear—not to contemporary needs, much less to future needs. They have changed slowly, while America has been changing rapidly.

It does not follow that the increasing lag has led to increasingly inadequate fire protection. For, as the National Fire Protection Association has documented, our Nation's dollar losses from fire (adjusted for inflation) has not worsened materially over the years. The percentage of national wealth destroyed by fire has actually been decreasing by a very small extent. What follows is that, if the Nation's fire record is to improve significantly, our methods of protection against fire losses must respond, more effectively than they have thus far, to important changes that have been taking place in America.

One such trend is the increasing urbanization of the United States. Half a century ago, about half our population lived in urban areas. Today, about three out of four Americans do. While distances from firehouse to fire site are generally shorter in urban areas than in rural areas, clogged city streets often add costly minutes to response time when a fire breaks out. Intensive use of land in urban areas means bigger buildings, which create complex problems of fire safety. More people are concentrated and exposed to the threat of fire or its toxic smoke. High-rise buildings, though hallmarks of urban progress, are special nightmares to firefighters. Upper floors are hard to reach, and it is difficult to vent heat and smoke in modern air-conditioned buildings.

Urbanization has created social problems—the migration of the poor into cities, the expansion of ghettos, the rising expectations of minorities which are being met only laggardly—that have affected the magnitude of fire losses. The most rundown neighborhoods, where dilapidated buildings are tinder boxes, are where the poor are forced to live.

The crowded apartment houses and tenement buildings

often reflect total indifference to fire safety, because landlords see no benefit in decent, long-term upkeep of their properties. Tenants must often warm their rooms with dangerous portable or make-shift heaters because central heating is inoperable or nonexistent. Discontent in the ghettos can breed problems for fire departments: in the form of riots, set fires, false alarms, and harassment of firefighters.

The movement of America's minorities for recognition of their rights has forced upon us the realization that fire departments are, in general, manned disproportionately by white Americans. Racial minorities are under-represented in the fire departments in nearly every community in which they live.

Another social change pertinent to the Nation's fire protection is the increased militancy of municipal employees. Firefighters have seen what unionization has done for the salaries and benefits of other city employees. They have seen conditions improve for other municipal departments while they have been bypassed. Quite understandably they have petitioned for higher wages and better working conditions. In the past half-dozen years, in some of the larger cities, they have also undertaken job actions—slowdowns, massive sick leaves, and even a few strikes—which jeopardized fire protection for the community.

The increasing militancy of firefighters meets, head on, another important change: the increasing financial plight of local governments. Especially in the large cities, but not exclusively there, governments are facing static or declining tax revenues, increasing costs, and hence the need to question all city expenditures and to place greater emphasis on the efficient operation of municipal services. Local governments are demanding better long-range planning and better utilization of manpower and equipment. They are pressing fire departments to produce sophisticated cost-benefit justifications for their expenditures. They are demanding that fire departments operate more efficiently without jeopardizing the public's safety from fire.

This makes pertinent a further trend in our society: the increasing application of management science to solve these local problems. Local governments are calling in research experts to review municipal services with the same systems approaches that have worked so well in industry.

Still another important change bearing on the Nation's fire protection is the so-called technological revolution. Our man-made environment is being filled with new materials and new products about which little is known concerning their hazard potential when they burn. New chemicals and other hazardous materials are being produced, shipped, and used around the country. Often fire departments are unaware of these dangers in their midst, nor have they experience in dealing with them. Some of the new products produce toxic gases

while burning that are far more deadly than the kinds of smoke firefighters are accustomed to.

About the technological revolution it can also be said that it has hardly touched the fire services. In comparison with such fields as aviation, large-scale construction, and electronics, the technology of firefighting has been relatively stagnant. Ironically, while flammability standards have been imposed on children's sleepwear, no such standards exist for firefighters' "turnout" coats.

PREVENTION NEEDS PRIORITY

Response to important social changes is a key to improving the Nation's record in fire protection. A consideration of equal importance is the need to change priorities in the field of fire protection. Currently, about 95 cents of every dollar spent on the fire services is used to extinguish fires; only about 5 cents spent on efforts—mostly fire prevention inspections and public education programs—to prevent fires from starting. Much more energy and funds need to be devoted to fire prevention, which could yield huge payoffs in lives and property saved. (While fire prevention efforts would lower the incidence of fire and, hence, might lower the costs of fire suppression, it would be essential to support fire suppression services at current levels until a marked reduction in fires had been documented.)

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