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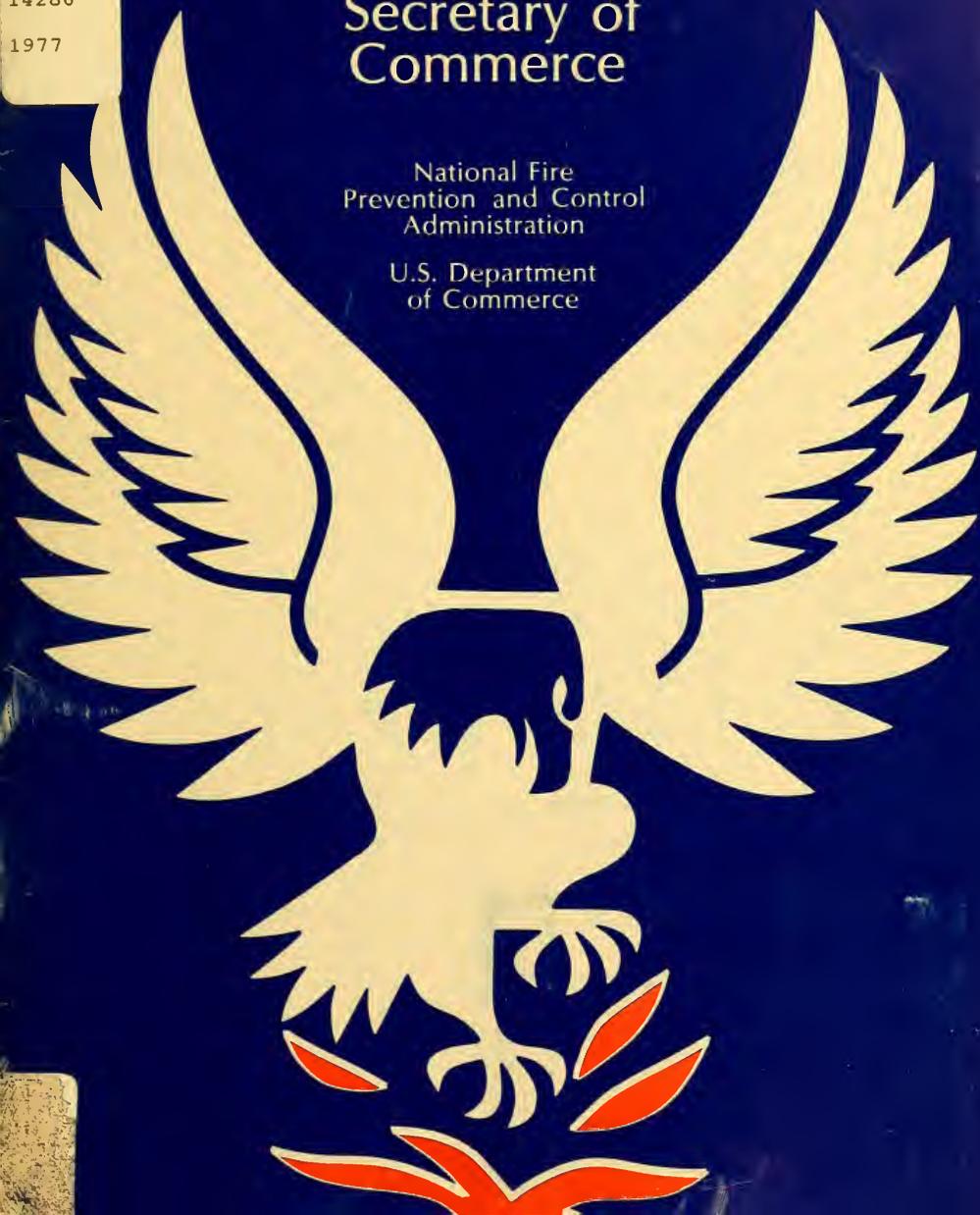
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1977

# Fourth Annual Report of The Secretary of Commerce

National Fire  
Prevention and Control  
Administration

U.S. Department  
of Commerce



Sirs,

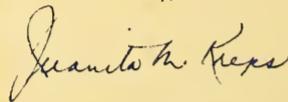
It is my honor to submit the Fourth Annual Report of the National Fire Prevention and Control Administration for calendar year 1977.

While the report describes in detail all of the Agency's efforts to reduce the loss of life and property caused by fire, your special attention is invited to the following highlights:

- The National Fire Administration announced the findings of its first national estimates of death, injury, and property losses due to fires in the United States in October 1977. Findings indicate that approximately 7,500 Americans die and 310,000 are injured annually. The property damage cost is \$4.2 billion.
- A smoke detector campaign was developed, including a five-part series of booklets which assist local fire departments to promote use of the devices in their communities. Under the smoke detector training program, 976 smoke detector specialists from 238 communities were trained in September and October 1977. These specialists were scheduled to train another 16,800 local fire department personnel.
- The Administration's National Academy for Fire Prevention and Control developed a series of 10 courses for presentation in 1978 in the 10 Federal regions.
- The master planning for fire prevention and control program moved from pilot to implementation stage during 1977. Two guides, the *Basic Guide* and the *Urban Guide*, were released to assist different size locales in developing fire prevention and control master plans.
- Continued research in the field of smoke detectors conducted by the National Bureau of Standards, Center for Fire Research, in conjunction with Underwriters Laboratories, led to UL adoption of the first smoke detector standard in the U.S., U.L. 217, which helps to assure the consumer of a quality product.

A major thrust of the National Fire Administration's activities was directed toward assisting state and local fire prevention and control efforts through a grants-to-states program.

Sincerely,



Juanita M. Kreps

The President  
The President of the Senate  
The Speaker of the House of Representatives

501-712083  
1977

**The Fourth  
Annual Report of  
the Secretary of  
Commerce  
on Implementation of  
the Federal  
Fire Prevention  
and Control Act of 1974**

Public Law 93-498

Report for Calendar Year 1977

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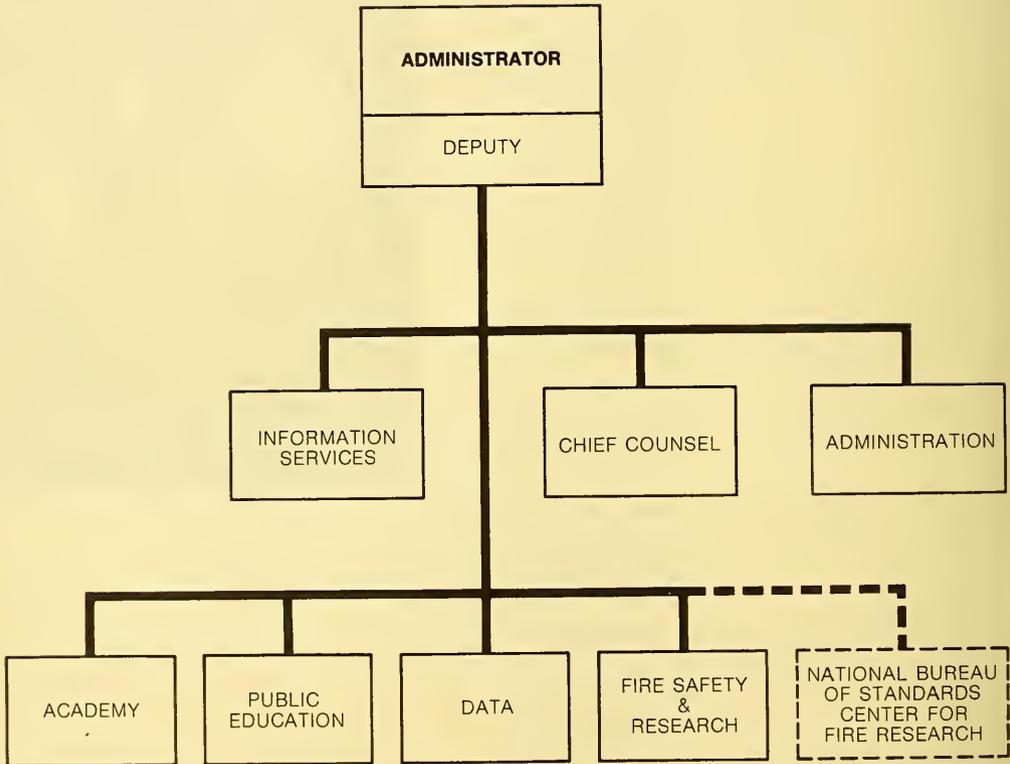
**Juanita M. Kreps**  
Secretary of Commerce

**Howard D. Tipton**  
Administrator  
National Fire Prevention and Control Administration

**David A. Lucht**  
Deputy Administrator  
National Fire Prevention and Control Administration

Figure 1

**U.S. Department of Commerce**  
**National Fire Prevention and Control Administration**



# Foreword

Every day, day after day, \$11 million in property goes up in flames across America—over \$4 billion a year! When all the costs incurred by this Nation due to fire are tallied, the figure exceeds \$14 billion annually.\*

In the past 12 hours, 10 persons have died from fire—several victims were probably children. At least 423 others were injured; some will be scarred and disfigured for life, while others escaped with minor injuries.\*

America is still burning.

The homes we live in, the clothes we wear, the chairs we sit in and the buildings we work in—all can burn. Two-thirds of all fire victims die wrapped in the security of their homes—by ones and twos, most often at night.

The men and women who respond to the 2.6 million reported fires\* each year are not immune to fire's destruction. Firefighters are members of America's most hazardous profession. Their death rate is staggering. More than half of all reported fire injuries are suffered by firefighters.

Fire is a "Fact of Life" in America.

The National Fire Prevention and Control Administration (NFPCA), an agency of the U.S. Department of Commerce, is now three years old and is providing a Federal focus for America's fire problem and the major issues surrounding it. Some of these issues are:

- 1) The need for a uniform, broad-based pool of data with which to identify America's fire problem.
- 2) The need for safer homes through education and technology.
- 3) The need to protect firefighters from death and injury.

- 4) The need for comprehensive fire prevention and control planning on all levels of government.
- 5) The need to conquer arson.
- 6) The need for improved education and training for the Nation's fire protection community.
- 7) The need for a basic understanding of fire and its effects.
- 8) The need to provide assistance to state and local governments.
- 9) The need to provide a focus for the Federal fire community.

Fire remains a state and local problem. The National Fire Administration's role is to support and reinforce state and local efforts for fire prevention and control.

Improving the effectiveness of state and local efforts is the major thrust of the NFPCA. Since the agency was established, intensive work has been conducted to identify the priority needs on the state and local levels; develop new and improved fire prevention and control techniques; test those techniques; and provide the leadership, incentives, and methods to get those techniques into use at state and local levels.

## Funds and Personnel

To carry out this work, the National Fire Administration has four divisions: the National Fire Data Center, the National Fire Safety and Research Office, the Public Education Office, and the National Academy for Fire Prevention and Control. The programs of the Center for Fire Research, a branch of the Commerce Department's National Bureau of Standards, are linked to those of the National Fire Administration.

(See Figure 1, Organization Chart.) Resolving the issues surrounding fire requires a broad-based attack, and the NFPCA confronts this task as an interdisciplinary team, with each unit contributing its unique resources.

To conduct the programs of the NFPCA, a budget of \$13.8 million was appropriated for Fiscal Year 1978. Figures 2 and 3 illustrate the allocation of these funds.



By December, 1977, the NFPCA staff numbered 92 fulltime employees. The staff was bolstered by eight individuals during 1977 under the Intergovernmental Personnel Act (IPA), which provides for the temporary assignment of local government employees to the Federal government. The IPAs, experts in various areas in which the Administration is working, represented fire departments and other organizations from across the Nation.

In the following chapters this report will discuss the major issues which the National Fire Administration is working to resolve.

\*These figures are averages based on data from "Fire in the United States."

Figure 2

**Financial Resources: FY 1977 and FY 1978**

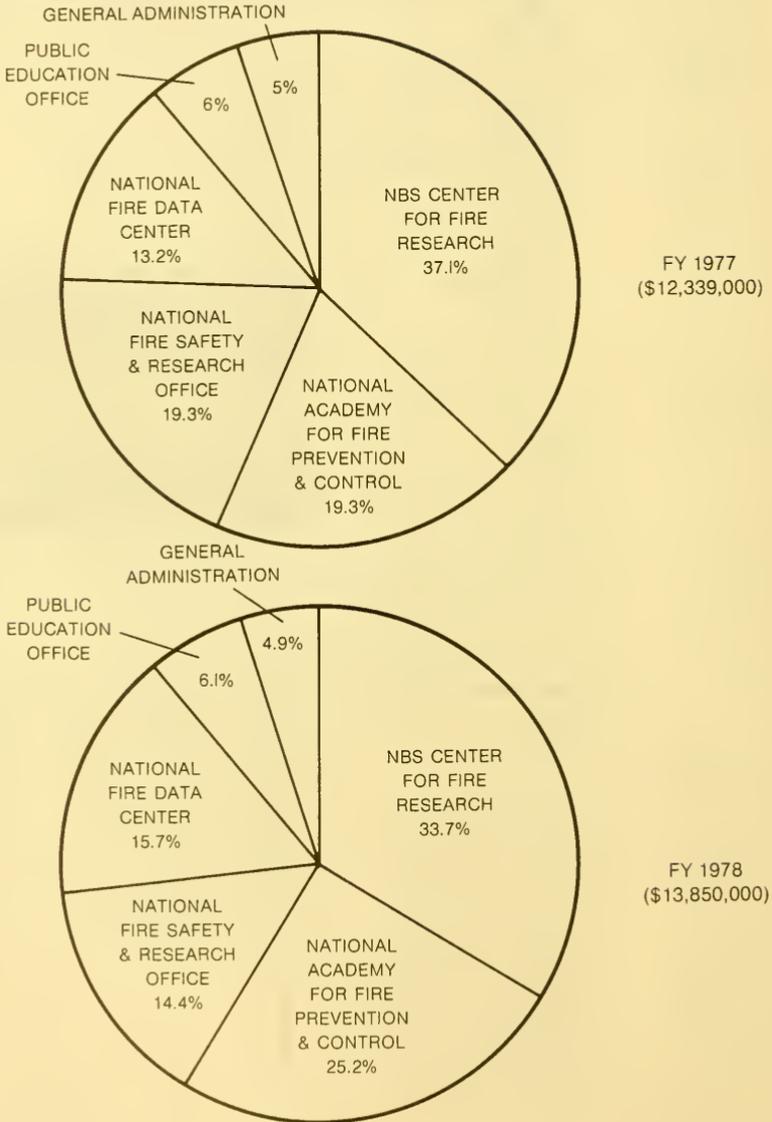
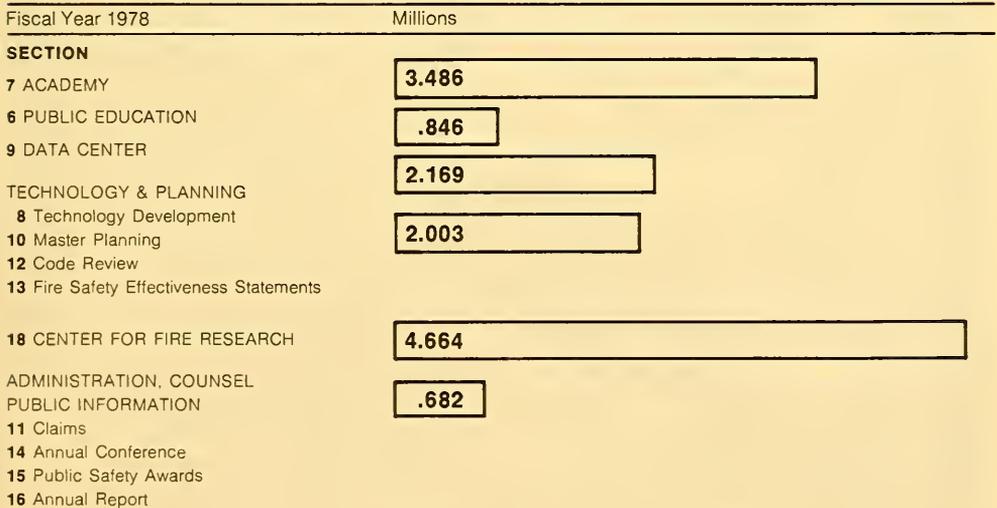
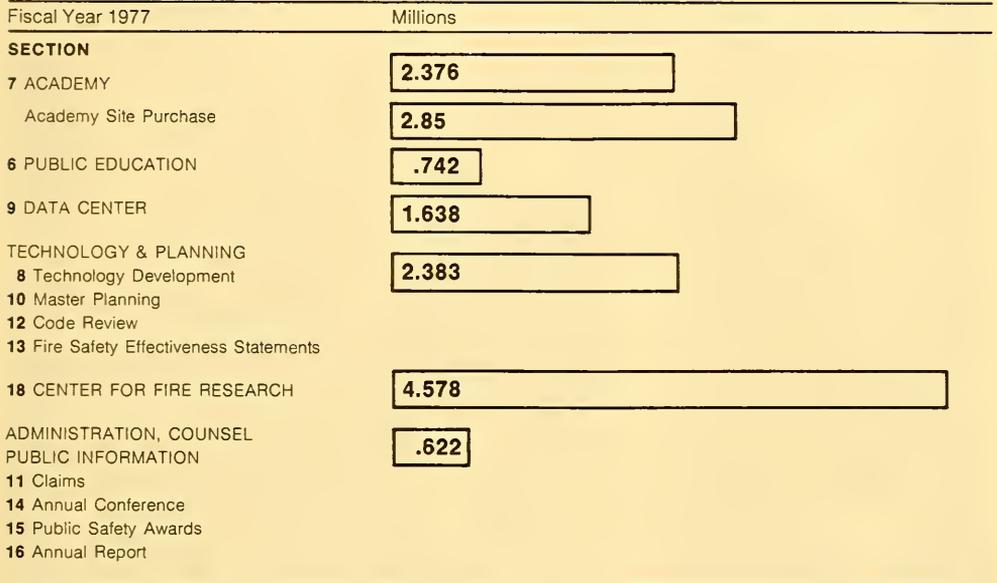


Figure 3

### Financial Resources Obligated According to Sections of the Federal Fire Prevention and Control Act of 1974





# Executive Summary

This year's Annual Report of the Secretary of Commerce features a new approach. Each chapter focuses on a major fire problem or issue, discusses its background, and highlights what the Fire Administration has done in connection with the specific subject area.

Section 16 of Public Law 93-498 requires the Secretary to annually report to the Congress and the President regarding the activities and programs of the Fire Administration. Section 16 stipulates nine distinct items to which the report must respond. These are listed as sub-parts (a) through (i) of Section 16. All of these items are responded to in Chapters 1 through 11 of this report, within the context of the issues and problems to which they relate.

This Executive Summary details each of the nine specific items required by Section 16, highlights the response to each of these items and refers the reader to in-depth discussions which appear in the chapters.

*Section 16: . . . Such report shall include, but need not be limited to—*

*(a) a thorough appraisal, including statistical analysis, estimates, and long-term projections of the human and economic losses due to fire;*

The National Fire Data Center released its first comprehensive appraisal of "Fire in the United States" in late 1977. The report, based on data from a variety of sources, presents estimates and analyses of the fire problem in the mid-1970s. Some of the findings in that report are as follows:

- Fire is one of our Nation's major problems. It causes more loss of life and property than all natural disasters combined. In the home, it is the second most frequent cause of accidental death. If "catastrophe" can be defined as the event that causes five or more deaths at one time, then fire is the catastrophe

that occurs most frequently in the U.S.

- 2.6 million fires are attended annually by the fire service, and another 30 million fires, mostly minor, are not reported to the fire service.
- 7,500 fire deaths occur annually.
- 110,000 fire injuries are reported and an estimated 200,000 additional injuries from fires not reported to the fire service occur annually.
- \$4.2 billion in direct property is lost from fire annually.
- Residential fires are the main killer. Approximately two-thirds of all fire deaths occur in ones and two in the victims' homes.
- Males (especially non-white males), the very old, and the very young are high-risk groups. Males outnumber females almost two to one as fire-death victims.
- Non-white males have more than twice the fire-death rate of white males, and almost twice that of non-white females.
- Non-white females have almost three times the fire-deaths rate of white females.
- Firefighting is the nation's most hazardous profession in terms of death rates. Firefighting deaths are most often (45 percent) due to heart attacks.
- Firefighters incur over half the injuries reported for fires attended by the fire service.
- The overall fire-death problem seems more severe in large cities and rural communities than in medium-sized cities.
- Statewide fire-death rates are highest in the Southeast (over 40 deaths per million) and are lowest in Hawaii, the West and a scattering of other states.
- National trends and regional similarities exist, but there are also striking differences from place to place in important aspects of the fire problem.
- The annual U.S. fire-death rate has declined slightly over the last 20 years, although it is close to tying with Canada for the highest rate in the world.
- Direct dollar losses from fire, adjusted for inflation, have doubled over the last 20 years. Per capita loss, also adjusted for inflation, has increased by about 40 percent in that same period. Overall, losses have remained a fairly consistent percent of the Gross National Product.
- In the two states examined in detail for these estimates, Ohio and California, which collectively represent about 15 percent of the U.S. population, fire cause patterns were quite similar: the residential fires which comprise only 22 percent of all reported fires, account for 68 percent of all reported



deaths, 57 percent of the injuries, and 43 percent of the dollar loss.

- In Ohio and California the eight major causes of residential fires that account for 79 percent of all residential fires are as follows: cooking, 18 percent; smoking, 13 percent; heating, 13 percent; incendiary or suspicious, 11 percent; electrical distribution, 7 percent; appliances, 7 percent; children playing, 5 percent; and carelessness with open flame or spark, 5 percent.
- In Ohio and California the most frequently reported cause of residential deaths (29 percent) and injuries (18 percent) is smoking, resulting from cigarettes igniting beds or upholstered furniture. The second most frequent cause is cooking fires with 9 percent of deaths and 13 percent of injuries.
- The incendiary/suspicious fire accounts for the most residential dollar loss (16 percent) in the two states.
- In Ohio and California non-residential building fires account for only 10 percent of all fires, and 7 percent of the deaths, but ties with residential fires for 43 percent of the dollar loss figure.
- Incendiary and suspicious fires are the number one problem for non-residential buildings. They account for 20-25 percent of non-residential building fires, deaths, injuries, and losses.
- Nine out of 10 household fires are not reported to the fire service.

The appraisal of the American fire problem in "Fire in the United States" is presented to describe the magnitude of fire in the mid-1970s. Although not enough is yet known to predict trends on specific fire problems, the

report provides tentative recommendations based on the data presented. In addition, it illustrates a variety of ways State and local governments can analyze their own fire incident and casualty data to improve management and to set fire prevention program priorities suited to local needs.

Additional statistical information can be found in Chapter 1, "Data." This information is based upon details presented in the report "Fire in the United States."

Other statistical areas in that chapter cover consumer products, mobile homes and major fire investigations.

Data on firefighters is presented in Chapter 3, "Firefighter Safety," which discusses injuries and deaths and the importance of physical fitness. Arson statistics in terms of dollar loss and number of fires are discussed in Chapter 5, "Arson."

*(b) a survey and summary, in such detail as is deemed advisable, of the research and technology program undertaken or sponsored pursuant to this Act;*

The research and technology programs fall into two distinct categories: in general, fundamental research is conducted by the Center for Fire Research (CFR), National Bureau of Standards and applied technical and management research programs fall under the Fire Administration's National Fire Safety and Research Office (NFSRO). The programs of these two units are coordinated and mutually supportive.

The Center explores a variety of basic fire questions relating to ignition, fire growth and spread, fire detection and suppression, and fire's effects on people. The basic research strategy of the Center is to intervene in fire's chain of

events, wherever possible. Chapter 7, "Basic Research," discusses these activities.

The National Fire Safety and Research Office programs cover several vital fronts, for example, residential fire suppression and detection, firefighter safety, fire prevention and control master planning, and researching and reviewing fire codes and regulations.

In the area of residential fire safety, the NFSRO sponsored six major studies in 1977 to explore the feasibility of home suppression, detection, and early warning systems. These programs are discussed in Chapter 2, "Residential Fire Safety." In Chapter 3, "Firefighter Safety," the NFSRO's programs aimed at better protection of the Nation's men and women who respond to fires are discussed, including the interagency

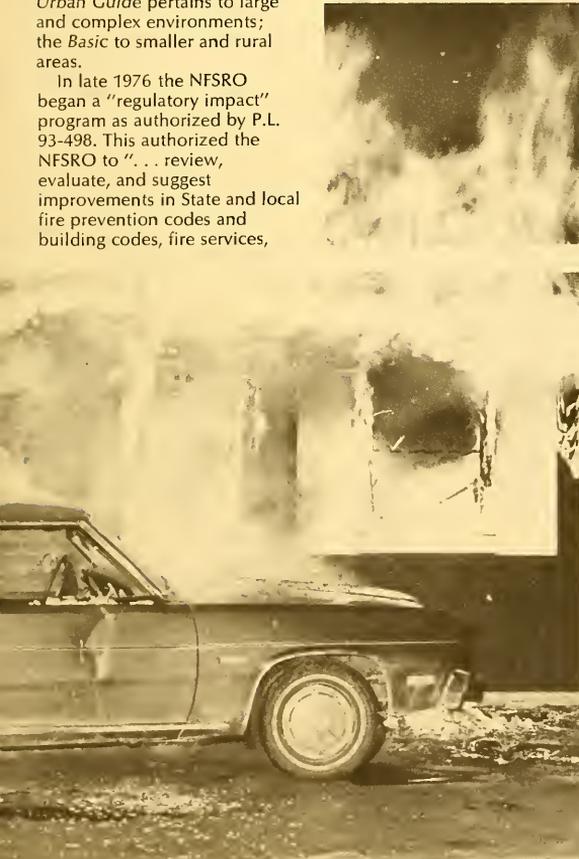


program with the National Aeronautics and Space Administration for the design of a protective clothing and equipment "envelope."

The fire prevention and control "master planning" program is the subject of Chapter 4, "Planning for Fire Safety." Both the *Urban Guide for Fire Prevention and Control Master Planning* and its companion, *Basic Guide* became available in 1977. The *Urban Guide* pertains to large and complex environments; the *Basic* to smaller and rural areas.

In late 1976 the NFSRO began a "regulatory impact" program as authorized by P.L. 93-498. This authorized the NFSRO to "... review, evaluate, and suggest improvements in State and local fire prevention codes and building codes, fire services,

and any relevant Federal or private codes and regulations. . . ." In Chapter 1, "Data," there is a brief overview of this activity. Under a 1977 grant, for example, the University of Maryland has begun developing analytical methods for conducting evaluations of the numerous model codes and standards in the U.S. This work will also form the basis for developing Fire Safety Effectiveness



Statements, called for in Section 13 of the Act.

(c) a summary of the activities of the Academy for the preceding 12 months, including, but not limited to—

(1) an explanation of the curriculum of study;

Chapter 6, "Education and Training," provides a detailed look at the 10 courses the Academy prepared in 1977 for presentation in 1978. By the end of 1977 these 10 courses were in various stages of completion; while some were in the process of being pilot tested, others were still in the developmental stages. Further details on certain courses can be found in: Chapter 1, "Data," relating to the National Fire Incident Reporting System; in Chapter 4, "Planning for Fire Safety," and in Chapter 5, "Arson."

(2) a description of the standards of admission and performance;

The National Fire Academy, which has purchased the Majorie Webster campus site in Washington, D.C., will offer courses through an "outreach" program described in Chapter 6, "Education and Training." Through a series of 10 regional meetings across the U.S. in 1977, 300 participants worked with the Academy staff to decide dates, times, and procedures for 1978 off-campus course delivery. Selection of students to attend these courses will be made by state and local fire officials not the Academy. Admission criteria and performance standards for on-campus courses will be determined in 1978.

Chapter 6 also reviews efforts to study accreditation and non-traditional approaches to firefighter education.

(3) the criteria for the awarding of degrees and certificates;

Chapter 6 presents



information on studies into accreditation and non-traditional learning approaches. Criteria for awarding certificates in the outreach program vary from course to course. The instructor must be satisfied that the student satisfactorily met the course learning objectives.

*(4) a statistical compilation of the number of students attending the Academy and receiving degrees or certificates;*

By the end of 1977, a total of 1,194 students had participated in Academy-developed programs. The seminars and course presentations were held around the country as well as in Washington, D.C. As the Academy site has not yet been renovated, no presentations were made at that "hub" facility.

The statistical breakdown of the number of students completing seminars and courses sponsored by the Academy follows:

Course - Seminar	Number Students
Advanced Arson Seminar	150
Analysis System for Fire Service Operations	54
Master Planning Overview Presentation	858
National Fire Incident Reporting System	84
Pesticide Fire & Spill Course	23
Preparation for Master Planning	25
<b>Total</b>	<b>1,194</b>

Other courses were not yet ready for pilot testing or regular presentation.

*(d) a summary of the activities undertaken to assist*

the Nation's fire services;

Almost every major activity of the National Fire Administration either directly or indirectly benefits the American fire service. For example "Data," Chapter 1, offers an explanation of how the fire service can derive major benefits from comprehensive data collection under the National Fire Incident Reporting System. Not only can it help draw a picture of a city's or state's fire problems, but it can serve as a planning, management and budget tool for fire department and related operations.

Chapter 2, "Residential Fire Safety," details how, through technology and research, homes can be made safer with better suppression, detection and early warning devices, and how public education personnel in local fire departments can better educate the public to the hazards of fire.

In "Firefighter Safety," Chapter 3, efforts to provide better protective clothing and equipment, improve firefighter physical fitness, and reduce burn injuries are discussed.

Providing the fire community with the management tools to make better decisions is one of the goals of the fire prevention and control master planning program presented in Chapter 4, "Planning for Fire Safety." Guides to aid urban and small communities were published in 1977.

Arson, a complex, rising problem that affects not only the fire community but the community at large, is the subject of Chapter 5. Arson is an issue which the National Fire Administration is combating on several fronts. Through a program which enables communities to predict arson, to courses for advanced arson/fire investigators, the

NFPCA moved ahead during 1977.

Adequate education and training opportunities, which play an important part in advancement for most occupations, are not readily available to a large portion of America's firefighters. To assist them in widening their educational horizons, the NFPCA's National Fire Academy prepared 10 courses for presentation in 1978. The Academy's "hub" facility was purchased in 1977 and is intended to serve as the focal point for that unit's activities. However, the Academy determined that to broaden its reach efforts will be made to "train the trainers" who will return to their home states and "re-teach" courses taken through the Academy. Other methods, such as offering classes in 1978 in each of the 10 Federal regions, will increase the Academy's ability to reach students. Chapter 6, "Education and Training," discusses the Academy's plans and courses for "advancing the professionalism" of America's fire service community.

Another important arm of the fire services is the scientific, engineering, and technical branch, discussed in Chapter 7, "Basic Research." Through the work of the Center for Fire Research, the fire service community will benefit from improved knowledge about fire, its behavior, and effects.

A major objective of the NFPCA is to assist and encourage state and local governments with their fire prevention and control work. To promote this objective, the National Fire Administration has four "grants-to-states" programs: PDAP—Policy Development Assistance Program; APAP—Academy Planning Assistance Program; NFIRS—National Fire Incident

Reporting System; and PEAP—Public Education Assistance Program. During 1977 PDAP, a program to transfer the master planning concept to state-level fire prevention and control program planning, was developed for pilot testing; grants will be awarded to three or four states in 1978. APAP is a 2-phase grant program which assists states in developing a systematic educational delivery system. In 1977 17 states received grants for Phase I or Phase II of APAP.

Under the National Fire Data Center's NFIRS program, the total number of states in the nationwide data collection program reached 19 in 1977. Based on information from NFIRS and other sources, the Data Center presented its first national estimates in late 1977. NFIRS grants are awarded to the state-level agency responsible for a particular state's fire data collection efforts. All three levels of government benefit from the kinds of information available through the NFIRS system: local, state and Federal.

Public fire education has a measurable, dramatic impact on fire losses. The NFPCA's Public Education Office awarded four PEAP grants in 1977 to assist those states in planning, implementing, and evaluating public education programs; and disseminating program information and technical assistance to the local fire service.

The fire-related activities of the Federal Government, discussed in Chapter 9, "Federal Fire Focus," are also part of the NFPCA's work to assist the Nation's fire community. During 1977, work which resulted in saving time and money on Federal equipment procurement was carried out. For example, the NFPCA distributed purchase



specifications for pumpers and aerial ladder trucks. This standardization helped to cut delivery time by up to 24 months and cost by up to \$10,000 per vehicle for several Federal agencies. On another front, better Federal fire reporting was the result of a major study.

Three other programs being carried out by the NFPCA to benefit the fire service community are reimbursement for fighting fires on property under Federal jurisdiction, management of the Public Safety Awards program, and conducting an annual conference. These subjects are discussed in detail in Chapter 10, "Other Administration Concerns."

(e) *a summary of the public education programs undertaken;*

A major campaign to educate the public on smoke detectors was continued by the Public Education Office in 1977.

Working through the local fire services, the PEO published and distributed a 5-manual smoke detector series on such topics as legislation, obtaining resources and working with the public. The PEO also conducted seminars for 976 smoke detector specialists from 238 communities. They, in turn, were scheduled to train another 16,800 local fire personnel. Chapter 2, "Residential Fire Safety," covers this program as well as another major PEO program centered on home fire safety surveys. In 1977 a pilot program through which senior

citizens were trained to conduct home fire safety inspections was successfully presented.

Other PEO accomplishments can be found in Chapter 3, "Firefighter Safety." To provide the fire community and the public with information on emergency burn treatment and to develop guidelines for joint fire service/medical community burn prevention programs, a conference was held in mid-1977 in cooperation with the International Association of Fire Fighters, Inc. A document on simple emergency burn care procedures and successful fire/burn prevention programs was drafted in late 1977.

Chapter 6, "Education and Training," describes a joint PEO and National Fire Academy program begun in 1977 to develop courses for public education specialists; the final package will consist of three separate courses.

The PEO program to assist states, the Public Education Assistance Program, was begun in 1977, with four states receiving grants. Chapter 8, "Assistance for State and Local Governments," has details of the program.

(f) *an analysis of the extent of participation in preparing and submitting Fire Safety Effectiveness Statements;*

A description of the National Fire Safety and Research Office's regulatory impact program is in Chapter 1, "Data." Under a 1977 grant from the NFSRO to the University of Maryland, work has begun on developing analytical methods for evaluating the numerous model codes and technical standards in use today. This work will help to form a basis for developing Fire Safety Effectiveness Statements in the future.

(g) *a summary of outstanding*

*problems confronting administration of this Act, in order of priority;*

In Chapter 10, "Other Administration Concerns," one problem is presented: the current resource level.

(h) *such recommendations for additional legislation as are deemed necessary or appropriate;*

This information is found in Chapter 10, "Other Administration Concerns." As in the previous Annual Report, it is stated that the need for additional legislation is under review.

(i) *a summary of reviews, evaluations, and suggested improvements in State and local fire prevention and building codes, fire services, and any relevant Federal or private codes, regulations, and fire services.*

These activities, conducted by the NFPCA's National Fire Safety and Research Office, are discussed in Chapter 1, "Data." Based on information from in-depth studies, the NFPCA advocated fire protection sprinkler systems in all major public occupancy buildings. This stand was taken after an in-depth investigation of a 1977 supper club fire in which 164 persons perished.

The NFSRO has issued a grant to the University of Maryland to develop methods for analytically evaluating the numerous model codes and technical standards in use. Other technical studies on suppression and detection equipment conducted by the NFSRO, as described in Chapter 2, "Residential Fire Safety," may have an impact on this work, also.

For a listing of the major accomplishments of each NFPCA operating unit and the NBS Center for Fire Research, see Chapter 11, "Selected 1977 Accomplishments."

# DATA

**Issue: The need for a uniform, broad-based pool of data with which to identify America's fire problem.**

## BACKGROUND

A major stumbling block to understanding and solving America's fire problem is the lack of data. Without data, it can be virtually impossible for cities and states to identify their problems and determine their priorities. For example, in Lee-Summit, Mo., causes of fire problems were not well documented until Missouri and fire departments across that state joined the National Fire Incident Reporting System. When Lee-Summit began to receive detailed statistical reports on city fire problems, it became apparent that children were starting large numbers of fires. A public education program was initiated to reduce the number. Lee-Summit fire officials say their program worked with incidents involving children dropping more than 50 percent.

Accurate data has an impact on fire prevention and control efforts at every government level. In local jurisdictions it can help guide budgetary decisions ranging from increased funding for prevention activities to determining the need for new equipment. At the state level it can help determine education and training needs for the public and the fire community. On the Federal level data identifies those problem areas in which the National Fire Administration's research and assistance are most needed. For each level data describes trends, such as the upswing in arson or "hot spots" with high fire death rates. As valid data

becomes available, these trends and "hot spots" will become targets for major efforts aimed at reducing fire loss.

Data provides the backbone for rational decisions affecting fire prevention and control. On the local level it can be a valuable management tool supplying information on which to base decisions concerning money, personnel, equipment, codes, and regulations. As fire is primarily a local problem, providing quality data to communities is an essential component of the NFPCA data effort.

When the National Fire Administration began in 1974, no two states were collecting analytically compatible data. Forms, coding systems and terminology differed from state to state. The NFPCA, through its National Fire Data Center, has faced the major challenge of bringing order and uniformity to fire data collection throughout the nation.

## ACCOMPLISHMENTS

### National Fire Incident Reporting System

Nineteen states were participating in the Data Center's National Fire Incident Reporting System (NFIRS), a nationwide, standard data collection system by the end of 1977. (See Figure 4.) NFIRS main objectives are to obtain data with which to accurately assess the U.S. fire problem and to assist state and local governments upgrade their own fire reporting and analysis capabilities.

Through NFIRS data is collected by local firefighters at the fire scene, and passed to the state-level agency responsible for data collection

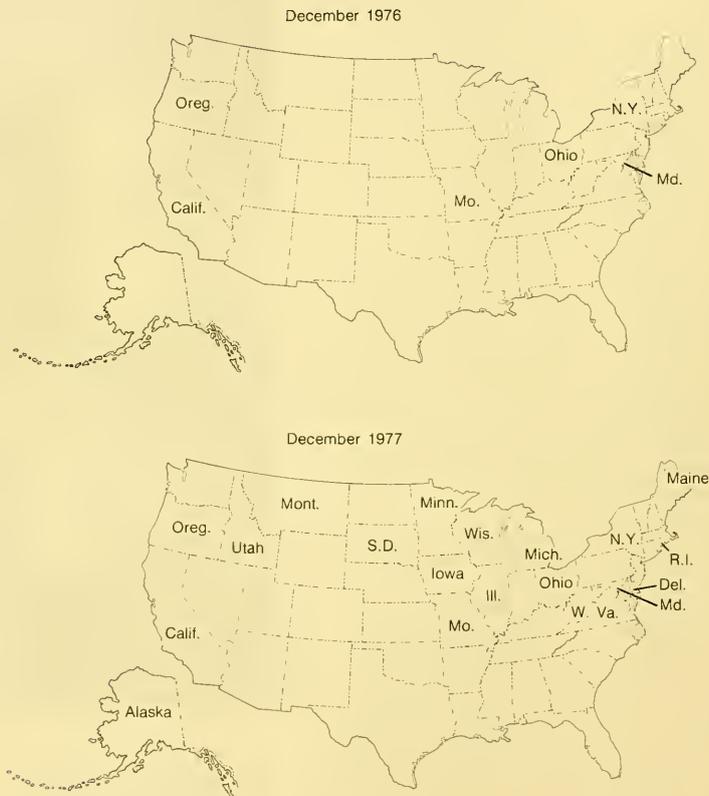


where it is computerized and used to produce a variety of state and local reports. A data tape is sent to the National Fire Data Center for use in analyzing the U.S. fire picture and as the basis for a variety of reports and studies. In this way, each level of government can use and benefit from the uniform data.

The State of Ohio, for example, was one of the original five NFIRS states. Upon

Figure 4

The Growth of the  
National Fire Incident Reporting System



analysis of the data, the State Fire Marshal's Office discovered one- and two-family residences were the state's major fire problem, the causes of numerous fires were traced to hazards of which the public was unaware, such as damp

charcoal, stored in winter, which can become combustible.

To create public awareness, a major public education campaign, with programs targeted to problems identified by the NFIRS data was undertaken. According to the

Ohio State Fire Marshal's Office, there was a 30% drop in injuries between 1976 and 1977 attributed to these programs. In 1976 the number of injuries was 4,935; in 1977, it had dropped to 3,469.

The Center's responsibilities include encouraging and assisting states and territories in converting to NFIRS and providing small start-up grants, computer software, technical assistance, and with the aid of the National Fire Academy, training in data collection and use.

The first five NFIRS states awarded grants in June 1976 were Ohio, New York, Missouri, Maryland, and Oregon. Another seven received grants in early 1977: Delaware, Iowa, Michigan, Minnesota, Rhode Island, South Dakota, and West Virginia. The last six joined the system in August-September 1977: Alaska, Illinois, Maine, Montana, Vermont, and Wisconsin. By December 1977, several of the NFIRS states had begun to transmit data to NFPCA.

The National Fire Administration has sponsored two "user conferences" for representatives of participating states. The first, hosted by Ohio in May 1977, brought together the 13 states then participating in the system to share their experiences. The second was hosted by the State of Missouri in October 1977, bringing together more than 50 representatives from participating states. The representatives agreed jointly to review and update the reporting system assuring that NFIRS will fit the needs of the states.

An improved standardized NFIRS Computer Software Package became available for state use in March 1977. This revised package includes more

thorough quality control checks for data validity. In addition, the package provides a "catalog" of some 200 available feedback reports which the states can run for their use or for state and local agencies to help them obtain information uniquely tailored to their needs. NFIRS states receive, from the Data Center, seven

detailed reports, six reflecting that state's data and one reflecting the U.S. picture.

In cooperation with the National Fire Academy, the Center has also developed instruction courses for use by state trainers who teach local fire personnel about the new reporting system. The NFIRS Training Package, which





provides standardized instructional materials, was successfully pilot tested in 1977. The Academy will provide NFIRS training to participating states. (See Chapter 6 to learn details of NFIRS training.)

Data validity is a prime concern shared by the National Fire Administration and participating states. An April 1977 validation study in Ohio concluded that, while the data being collected at that time were sufficient for some major policy decisions, increased

validity was needed. A broader study, involving more state and local governments, was designed in 1977 and will be conducted in 1978.

Using NFIRS and other data files, the Center produced over 1,150 computer reports in 1977 on specialized subjects ranging from fire casualties by age to statistics on the causes of non-residential fires. Report users included the Consumer Product Safety Commission, the National Institute of Occupational Safety and Health,

the Society of the Plastics Industry, NBS' Center for Fire Research, NFPCA staff, and building code organizations.

Private organizations have also sought and used NFIRS-based data. Honeywell Corp., Minneapolis, Minn., requested data on residential smoke detectors to use as part of its study on home products.

#### 'Fire in the United States'

"Fire in the United States," based in part on NFIRS data, was completed in December

1977. (See Bibliography.) The first in a series of annual statistical reports on the U.S. fire problem, it is one of the most comprehensive and detailed analyses of its kind.

Findings in this report include:

- In the mid-1970s, the Nation annually suffered about 2.6 million fires attended by the fire service and another 30 million fires, mostly minor, that were not reported.
- Males outnumbered females almost 2 to 1 as fire death and injury victims. Non-white males have more than twice the fire death rate of white males.
- The southeastern states and Alaska have the highest death rate in the country. Hawaii has the lowest rate.
- 110,000 fire injuries were reported to the fire service and some 200,000 fire injuries were not reported to the fire service.
- Firefighting is the Nation's most hazardous profession. Firefighter injuries account for over one-half of all reported fire injuries from reported fires.
- \$4.2 billion in direct property loss occurs annually.
- Compared to other countries, the U.S. fire incidence, casualties, and dollar loss rates per capita are among the highest in the industrialized world.
- The six major "causes" of residential fires are: cooking (18 percent), smoking (13 percent), heating (13 percent), incendiary or suspicious (11 percent), electrical distribution (7 percent), and appliances (7 percent). (This estimate is based on California and Ohio data only.)

The report's findings lead to the following major recommendations:

- Improve and emphasize fire prevention.
- Residential fires are the main



fire threat to human life and should receive priority attention.

- Smoke detectors, coupled with escape plans, appear to be the most promising approach for reducing home fire deaths.
- Physical fitness programs deserve emphasis to decrease firefighter deaths since nearly one-half of firefighter line-of-duty deaths are cardiovascular in nature.
- State and local governments should collect and analyze their own fire data to guide their fire programs. While national trends and regional patterns exist, there can be striking differences among similar communities.

The data system is not yet mature enough to make long-term projections of human and economic losses due to fire.

#### In-depth Fire Investigations

A second major data collection tool is the Data Center's in-depth fire investigation program. The objective is to provide highly detailed data on the fire problems that are the greatest concern in the fire community.

Three mechanisms alert the Data Center as to what to investigate: (1) analysis of NFIRS data which describes the worst fire problems (2) receipts of in-depth information requirements from other government agencies on the products and materials that are within their area of responsibility; (3) and requests from the fire community in general about new products that appear to be potential fire problems, such as insulation or wood-burning stoves.

This last mechanism for identifying what to investigate and the need for understanding where little is known about fire behavior, also applies to major fires and why they are investigated. State fire marshal investigators are used in this effort.

The information gained increases knowledge of the fire behavior of the "worst" products and occupancies, provides a better base for determining fire prevention measures, and can be used to evaluate and to improve codes and standards.

Targets of in-depth investigations in 1977 included mobile homes, consumer products and major fires, such



as the tragic fire at the Southgate, Ky., Beverly Hills Supper Club in which 164 persons perished.

The Data Center's mobile home study, funded by the Department of Housing and Urban Development, will help to determine the effectiveness of the Federal Mobile Home Construction and Safety Standard enforced by HUD. Eight states agreed to investigate mobile home fires for NFPCA: California, Florida, Georgia, Maryland, Michigan, Montana, Ohio, and Washington.

During 1977 a preliminary report was delivered to HUD outlining the extent of the mobile home fire problem and the likely effectiveness of the HUD-developed standard.

The study, "Preliminary Report: Analysis of the Mobile Home Fire Situation in the United States," indicates that the provisions of the Federal Standard probably would reduce the fire rate in mobile homes, but more detailed information is needed to verify this. Data from the State of California, which has a similar standard to HUD's, shows a lower rate of fatalities in mobile homes constructed after the California standard went into



effect. By the end of 1978 more than 650-700 in-depth investigations of mobile home fires will be carried out for a more thorough understanding of the standard's likely effectiveness.

Some of the other preliminary findings of the study indicate that while there is a statistically lower rate of fire in mobile homes as compared to conventional dwellings, the probability of death, once fire occurs, is nearly four times greater. This investigation is continuing.

Twelve consumer products are under study: aluminum wire, extension cords, furnaces, liquid fuels (gasoline), plastic case goods (furniture), ranges and ovens, small electrical kitchen appliances, space heaters, tents, TV sets, upholstered furniture, and wearing apparel. Fire

investigators in Dade County, Florida, and the States of Michigan, Oregon and Washington work through their state fire marshal's offices to report their findings on fires involving these products. An investigative package designed to ensure that the information recorded on each fire would be collected in a standard manner was pilot tested last year. Roughly 40 separate investigations in these areas were made during 1977, and the program is continuing. Data is sent to the Consumer Product Safety Commission for review and possible action.

Under a contract to the National Fire Protection Association (NFPA), 25 investigations of major fires, including the Southgate tragedy, were conducted in 1977.

A team with members from NFPCA, NBS and the NFPA worked with representatives from the Kentucky Governor's office to investigate the Beverly Hills Supper Club fire in Southgate, Ky. Other fires investigated under the NFPA contract include: a fire in the Prince Georges County jail, Upper Marlboro, Md., occurring on Oct. 12, 1976. Although there were no deaths or serious injuries in connection with this fire, it was considered worth investigating as it followed several other jail fires in which lives were lost and property was heavily damaged. The investigation indicated that the staff of the Prince Georges County jail were properly trained to respond to a fire situation.

### **Codes and Standards for Increased Safety**

Data from in-depth studies has a substantial impact on the Administration's concern for fire protection through codes and standards. For example, the NFPCA advocated fire protection sprinkler systems for all sizeable public occupancy buildings immediately after the Southgate disaster and pointed out that lower insurance premiums could pay for the cost of such a system in a few years in many instances.

The Administration is authorized to review, evaluate and suggest improvements in fire-related codes and regulations on all levels of government under Section 12 of Public Law 93-498. Currently, there are at least 10 major U.S. model codes relating to fire safety in buildings, plus hundreds of voluntary technical standards developed by various organizations. Under a grant issued by the Administration's National Fire Safety and

Research Office in the autumn of 1977, the University of Maryland began developing analytical methods for conducting these evaluations. This work will form the basis for developing the Fire Safety Effectiveness Statement program under Section 13 of the Act.

### **Indirect Loss and Unreported Fires**

In a study funded by the Data Center on the magnitude of indirect residential fire losses, Princeton University proposed methods by which local governments could assess their own indirect fire losses and categorize types of losses and associated costs. This report, "Indirect Losses Arising from Residential Fires," estimates that there are approximately \$200 million in indirect losses (medical expenses, temporary lodging, lost salary, etc.) associated with reported residential fires yearly in the U.S.. The study's most important feature is in providing local government with another tool with which to assess their losses. It also provides a better picture of the magnitude of the residential fire loss problem. Other studies conducted under the Data Center through a grant to the University of Wisconsin resulted in a report on the nature and magnitude of an estimated 30 million household fires not reported to the fire service annually.\* The report shows that only one in 10 household fires is reported and that half of all household fires with a property loss of more than \$200 are not reported to the fire service.

This study was undertaken to gain a broader national perspective of the fire problem. As most fire data is from fires reported to local fire departments, a study of fires not reported to them was considered a valuable data tool

for assessing the total national problem.

### **Growing Interest in Fire Data**

Numerous Federal and private agencies have an interest in the NFPCA's constantly expanding data base. For example, the National Conference of States on Building Codes and Standards is interested in the shortcomings of existing building codes as related to fire and ways to use data to improve the codes. The Society of Wood Science and Technology is seeking data on the fire safety record of structures built of lumber. The American Hospital Association and the International Association of Fire Chiefs are among other users.

Sharing data and other fire-related information is a primary reason for its collection. To assist the fire community and the NFPCA staff in obtaining data, technical information, and reports, the Data Center has established its Fire Reference Service. The Reference Service, centered in the NFPCA library, is responding to a growing demand for information. Toward the end of 1977, roughly 80 separate information requests were answered monthly. In addition, the unit publishes "Fire Technology Abstracts," a journal abstracting domestic and foreign sources of fire-related literature. (See Bibliography.) The Reference Service is also responsible for maintaining a major collection on arson, discussed in Chapter 5, as part of the NFPCA's coordinated effort to conquer arson.

\*Estimates based on a Bureau of the Census study funded by the National Bureau of Standards and the Consumer Product Safety Commission.

# RESIDENTIAL FIRE SAFETY

**Issue:** The need for safer homes through education and technology.

## BACKGROUND

Americans who die from fire most often succumb in their own homes. Most fatal residential fires claim only one or two lives, causing only momentary local interest.

Tragic fires, like the pre-dawn dormitory fire in Rhode Island, December 13, 1977, in which seven coeds perished, receive national notoriety. Yet, this and other major fires do not represent this Nation's major fire problem—the residential fire. About two-thirds of all U.S. fire deaths occur where we feel the safest—at home.

Making American homes safer is a major undertaking of the National Fire Administration and involves efforts in several program areas, including the National Bureau of Standards' Center for Fire Research (CFR). Education programs are in progress to make Americans more conscious of fire, and technological projects are underway to make America's homes safer.

## ACCOMPLISHMENTS

### Educating the Public

For the past three years, the Public Education Office (PEO) has concentrated on reducing fire losses through tested public fire education programs. Two such programs—smoke detectors and home safety surveys—are aimed at making homes safer.

Smoke detectors are the most significant technological device available to protect American





Bibliography.) During 1977 PEO distributed more than 69,000 copies of these publications, primarily to private citizens. More than 300 local organizations requested negatives to "Wake Up!" for local reprinting. Other organizations also joined the NFPCA in distributing the "Wake Up!" brochure which was developed by PEO, CFR, and the Consumer Product Safety Commission. As a public service Sears, Roebuck & Company distributed more than 4.1 million copies through 121 local fire departments. The Hartford Insurance Company distributed approximately 175,000 copies through its independent insurance agents. The brochures reached an estimated 5 million Americans during 1977.

To help local fire departments educate their communities about smoke detectors, the Administration published a 5-volume series of smoke detector manuals during 1977. (See Bibliography.) One of the manuals, *Smoke Detector Resource Catalog*, was mailed to nearly 30,000 fire departments. Coordinated by PEO, the manuals included input from each NFPCA unit. The National Fire Safety and Research Office and CFR contributed substantially to separate volumes. The manuals are:

*Smoke Detector Resource Catalog*, including a fact sheet on smoke detectors, guides to finding materials such as films and brochures, case histories of successful programs, a legislative overview, and techniques with which to evaluate programs;

*Smoke Detectors: Moving the Public*, a 2-part manual on generating support through community organizations and the media;

*Smoke Detector Technology*,

homes from fire. Data indicates that properly installed and maintained smoke detectors can significantly reduce loss of lives from fire. These devices, coupled with a practiced home escape plan, are a family's best protection against fire's effects.

With the emergence of competitively priced smoke detectors came demands from the public and fire service for up-to-date information on types of detectors, installation, and maintenance. From state and community governments came demands for information on legislation which could make smoke detector installation mandatory. To meet these information needs, PEO began an effective nationwide "smoke detector campaign."

For the consumer, a general fact sheet, "Smoke Detectors Save Lives," and a pamphlet, "Wake Up! Smoke Detectors Can Save Your Life If . . .," were released in late 1976. (See





a detailed description of smoke detector operation, selection, installation and maintenance;

*Smoke Detectors and Legislation*, an in-depth review of the current status of state and local smoke detector legislation; and

*Smoke Detector Training*, including practical applications from *Technology* and a suggested curriculum for training members of the fire prevention community to present smoke detector education to the public.

As well as showing fire department personnel how to develop, conduct and evaluate smoke detector programs, the manuals are being used to train state and local fire educators who teach both the fire service and the public. During 1977 the NFPCA developed, pilot tested and launched a year-long smoke detector training program. In September and

October 1977, 976 smoke detector specialists from 238 communities were trained. They, in turn, were scheduled to train 16,800 local fire personnel. By the end of 1978 approximately 9,000 smoke detector specialists will be trained across the United States; it is anticipated that they will teach another 72,000 local representatives to work in their communities.

Although smoke detectors, coupled with home escape plans, offer significant life-saving potential, they are not the total answer to residential fire safety. A home inspection, or home "survey," program in Edmonds, Wash., was one of many successful fire education programs identified by PEO. The Edmonds program had resulted in a 67% reduction in residential fire loss in one year. Under a grant from PEO, the Edmonds Fire Department developed a training package

for other communities to use in conducting similar programs. In the summer of 1977, the training package was tested in Edmonds with senior citizen "students."

That program was so well received that PEO convinced the National Council on Aging and ACTION/Older American Volunteer Program to adapt it for use by their members. In mid-October 1977 PEO and the National Council on Aging sponsored a pilot training course for senior citizen home surveyors in Huntington, W. Va. Based on this successful pilot, similar programs are in progress in San Antonio and Orange, Tex., Toledo, Ohio, Bozeman, Mont., and Syracuse, N.Y. Several other areas were considering the program by the end of 1977.

The Edmonds Fire Department is distributing the training package nationally. By the end of 1977 about 100 fire departments had begun using it as a prelude to conducting their own home inspection programs.

### **Safety Through Technology**

Making American homes more fire safe is not an easy task. With two-thirds of all reported fire deaths occurring in the home, the NFPCA now has several technical studies in progress through the National Fire Safety and Research Office (NFSRO) and CFR with the goal of increased, affordable fire safety for the American home.

Smoke detectors were studied under a major contract with NFSRO by the Aerospace Corporation. The objectives of the study, "Survey and Analysis: Occupant-Installable Smoke Detectors," include identifying manufacturers of residential detectors and noting available models, estimating current and future sales markets,

and determining the level of consumer awareness and acceptance. The study indicated that 33 million detectors are in place in 16 million American homes. It also noted that currently the sales volume of the units is approaching one million a month.

Home fire suppression systems, particularly those with a remote alarm to alert both the fire department and the occupants, offer major advantages. Through earlier alert and containment of the fire, damage will be reduced and the firefighting will be "safer."

During 1977 six major suppression-related studies were conducted by public and private organizations under NFSRO grants. Based on these studies, the NFSRO concluded that it is possible to design an effective, affordable fire suppression system for new homes.

In November 1977, the NFSRO introduced proposed standards for a new, low-cost fire sprinkler system aimed at reducing fire deaths, injuries, and property losses in residences.

The primary objective of the proposed standards, developed under contract by Factory Mutual Research Corporation, is to provide an automatic suppression system compatible with available water supply and pressure in the average home. Specifications call for a low-cost, small sprinkler head which will cover an area of 150-square feet under a pressure of 8 pounds per square inch, and require a maximum of 6 gallons of water per minute.

Additional studies on fire suppression systems have been completed by NFSRO which complemented the Factory Mutual study. These were carried out by Applied Physics

Laboratory of Johns Hopkins University, Battelle Memorial Institute, Factory Mutual and Rolf Jensen Associates, Inc. The studies were concerned with determining whether or not there would be a public demand for, and acceptance of, a relatively low-cost home fire suppression system; second, defining precisely what the system would be; and third, the impact of suppression systems on reduction of losses.

Finally, the performance standards will be provided to the NFPA for consideration. After their decision the specifications will be made available for commercial design of an actual system which could be on the market by 1980. It is expected that the cost for the system could average as low as \$50 per room in an average home.

Because of the high fire loss in homes, the agency has placed a high priority on developing an automatic sprinkler system that will be priced within the reach of the average homeowner.

Sprinkler systems were also studied by the Center for Fire Research. In 1977, tests were conducted to study the performance and use of light-duty support systems for sprinkler piping. Tests were also completed on the performance of sprinklers in health care facilities.

Smoke detectors were also studied at CFR, including the development of performance test methods, siting criteria and the work which led to the Underwriters Laboratories' adoption of a new smoke detector performance standard. This new standard helps to assure the consumer of a quality product.

The combination of residential furnishings and smoking materials account for 27% of home fire deaths,

according to a 1976 study of the 14 most common fire death scenarios conducted by CFR and the National Fire Protection Association. This created an interest in upholstered furniture. During 1977 a proposed cigarette test for upholstered furniture, developed for the Consumer Product Safety Commission, was submitted to the NFPA for consideration as a voluntary standard.

In other CFR efforts to make American homes safer, the flammability of insulation used in remodeling attics, walls and basements was studied. (See Chapter 7 for details.) Fire growth in rooms, the role of furnishings in room fire development, and the fire endurance levels of basement ceiling construction and interior finishes of mobile homes were also investigated.

Finally, the Fire Administration has cooperated with the National Science Foundation (NSF) in the interest of increased residential fire safety. NSF, through its Research Applied to National Needs (RANN) program, has funded fire research projects for a number of years. Since its beginning, NFSRO has worked closely with this program. This working relationship was strengthened in December 1977 when the Foundation transferred administrative and programmatic responsibility for six ongoing projects to the National Fire Administration. Each of these projects—on fire detection technology, low-cost residential sprinkler systems, scheduling fire service personnel, the effectiveness of municipal fire protection, equipment technology and fire alarm assignment systems—has a bearing on residential fire safety.

# FIREFIGHTER SAFETY



**Issue: The need to protect firefighters from death and injury.**

## BACKGROUND

Firefighting is America's most hazardous profession. The statistics are grim:

- Half of all reported injuries from fires attended by the fire service are suffered by firefighters.
- In the last 10 years, firefighters have averaged an annual 88 deaths per 100,000, compared with the 58 deaths for every 100,000 policemen.
- In a study of 101 line-of-duty firefighter deaths, 45 were caused by heart disease, three times the rate of the second highest cause of death.

The hazards of other occupations, mining and police work, receive far more public attention than those threatening firefighters. Increased occupational safety for firefighters is urgently needed both for the protection of the firefighters themselves and for increased firefighting effectiveness.

To better protect America's firefighters, the NFPCA conducted programs designed to provide better protective clothing and equipment, to improve the physical fitness of firefighters, and to reduce firefighter burn injuries.

## ACCOMPLISHMENTS

### Providing a Protective 'Envelope'

Americans may think firefighters are well protected when they enter a burning building but all too often, they

are not. Their clothing is not as resistant to fire as it should be: some helmets actually melt and some turnout coats and pants can melt and burn. The weight and bulkiness of firefighters' clothing and equipment can severely limit mobility and contribute to the strain on the firefighter, whose body is already working under the most severe of environments.

The National Fire Safety and Research Office began a major jointly-funded program with the National Aeronautics and Space Administration called Project FIRES (Firefighters' Integrated Response Equipment System) for the design and development of an integrated protective system or "envelope." The thrust of the program is to use modern technology, often the result of NASA's space technology, in a systems approach for providing improved clothing and equipment for firefighters. This cohesive approach contrasts sharply with the "piecemeal" approach of the past.

Understanding the fire environment within which a firefighter works is critical to establishing a protective envelope. To understand the occupational hazards of firefighting, NFSRO sponsored a study which resulted in the report "The Thermal Environment during Structural Fires." (See Bibliography.) This study provided an on-site appraisal of the thermal exposure firefighters face. The results show that firefighters endure mostly radiative not convective heat and will be used in designing improved protective equipment.

In another project the air contaminants of actual structural fires were sampled and measured. Knowing the toxic contaminants in the fire



environment will help define the respiratory protection requirements of the firefighters' protective envelope as well as contribute data on fire's deadly effects.

The NFSRO, in close cooperation with the Nation's fire service, has also placed emphasis on developing new performance criteria upon which equipment and clothing can be designed and manufactured. Helmets were one of the first pieces of equipment to be studied critically. In August 1977 "Model Performance Criteria for Structural Firefighters' Helmets" was published. The research for the criteria was conducted by the Institute for Applied Technology, NBS, which published a supporting study, "Considerations in Establishing Performance Criteria for Structural Firefighters' Helmets." (See Bibliography.)

#### **Improving Physical Fitness**

Firefighting is strenuous work requiring above average strength and endurance. Heart disease causes a high percentage of firefighter line-of-duty deaths. To meet their job demands and guard against heart disease, firefighters must be physically fit.

The Administration's work in the area of firefighter physical fitness was discussed in two reports published in 1977. "Development of a Job-Related Physical Performance Examination for Firefighters" highlights results of the first study (See Bibliography.) to measure in detail the physiological effects of firefighting on the heart, lungs and muscles. The report concludes that the successful completion of firefighting tasks requires a physical performance profile "reflecting youth" and that two-thirds of all

firefighters do not meet this profile. The study was conducted by the University of Maryland under a grant from the NFSRO.

Regular exercise can be the most effective method for remaining fit. More than 1,000 fire departments responded to a study conducted by the International Association of Fire Chiefs Foundation for the NFPCA's Data Center to identify fire departments with on-going physical fitness programs and to recommend which types of programs seem to succeed. Only 18% reported some type of active physical fitness program. Many of these programs are short-lived. Another 11% reported they had discontinued their physical fitness programs. The study results, published as "Fire Service Physical Fitness Programs," concluded that the fire service must begin to upgrade its in-service physical fitness training and offered suggestions. (See Bibliography.)

Physical fitness was also spotlighted in the Fourth Symposium on Occupational Health and Hazards of the Fire Service, held in April 1977, and co-sponsored by the NFPCA and the International Association of Fire Fighters' John P. Redmond Fund, a research foundation.

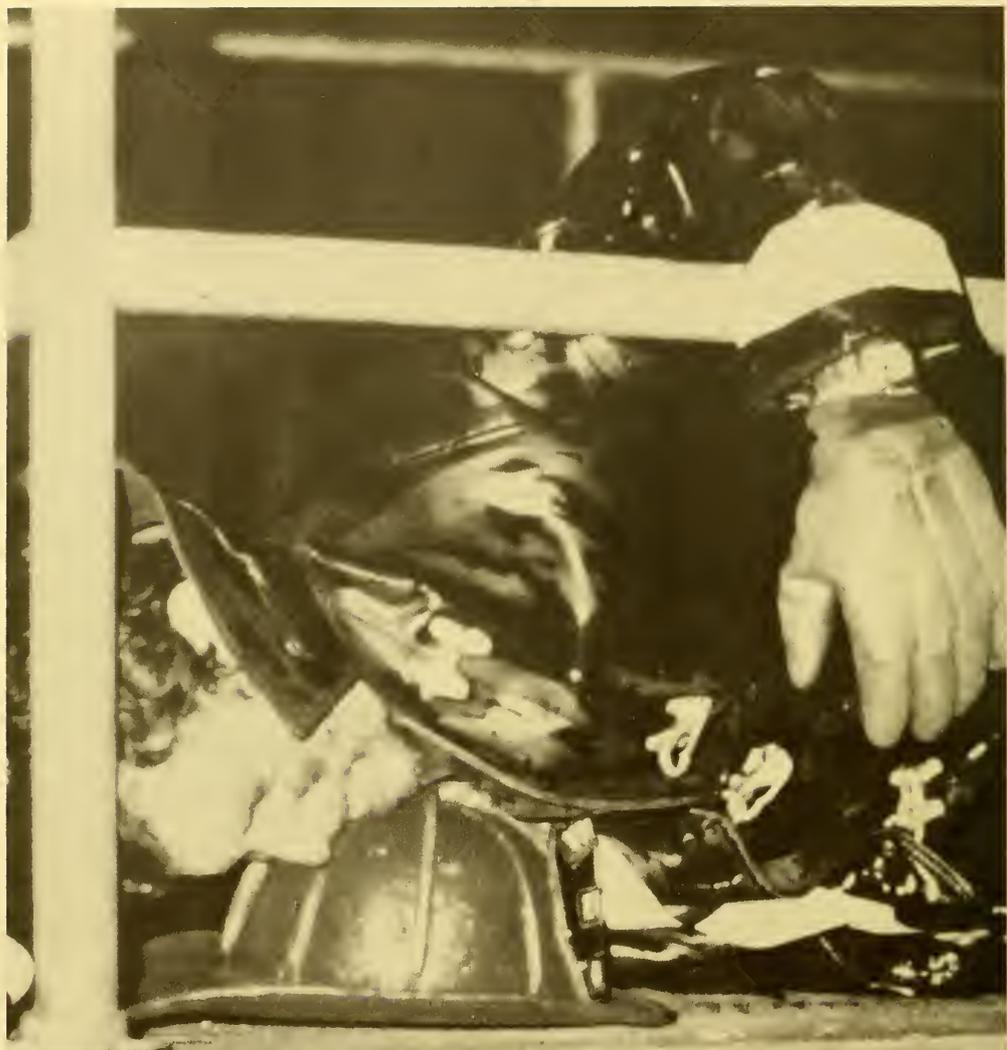
#### **Reducing Burn Injuries**

Firefighters compose one of the highest risk groups for burn or inhalation injuries. Correct, prompt emergency burn care treatment can minimize the seriousness of these injuries.

To provide information to the fire service and other fire educators, the Public Education Office (PEO) and the International Association of Fire Fighters held a burn prevention Symposium in mid-1977 which brought together

experts from the fire service and burn care profession to draft a document on simple emergency burn care procedures and successful fire/burn prevention programs. The Symposium proceedings will be disseminated in early 1978 through the IAFF and PEO.





# PLANNING FOR FIRE SAFETY

**Issue: The need for comprehensive fire prevention and control planning on all levels of government.**

## BACKGROUND

Fire protection is not solely the responsibility of a local fire department. Through comprehensive planning programs—master planning—fire departments, local officials, citizen groups and residents are joining together to provide the kind of protection that fits their community.

The needs and problems in the area of fire protection differ from community to community, but the need for comprehensive planning is constant. To aid communities of all types, sizes and locations across the U.S., the NFPCA, through its National Fire Safety and Research Office, developed the *fire prevention and control master planning* program. This is a systematic process for determining how much fire risk a community is willing to assume, how much fire protection it can provide, and different approaches for providing that protection.

These systematic plans are produced through a step-by-step procedure which requires involvement by the whole community. The completed plan should acknowledge today's fire situation, anticipate tomorrow's problems, and present alternative plans which meet fire protection needs.

The National Fire Administration's goal for the master planning program is to provide the tools needed to assist communities in their fire prevention and control planning efforts. At a time when local governments are struggling to maintain and improve the quality of public

services, the NFPCA's master planning program offers a valuable resource.

## ACCOMPLISHMENTS

### Assisting Urban Areas

Over 5,000 copies of the *Urban Guide for Fire Prevention and Control Master Planning* were distributed between its release on March 29, 1977, and the end of the year. At least 150 communities across the Nation have implemented programs based on the *Urban Guide*, a procedures manual which outlines the master planning process for developing and implementing urban-area master plans.

The master planning process was originally developed under grants to the cities of Los Angeles and Mountain View, Calif., Fire Departments. Thirteen communities pilot-tested the program at no cost to the Federal Government before release of the *Urban Guide*. Only technical assistance was made available to the communities. The cities were: Azusa, Calif.; Covina, Calif.; Edmonds, Wash.; Fayetteville, Ark.; Fremont, Calif.; Ketchum, Idaho; Richardson, Tex.; Springdale, Ark.; Springfield, Ill.; Tulsa, Okla.; Virginia Beach, Va.; Washington Township, Gloucester County, N.J.; and West Covina, Calif.

Springfield, Ill., one of the original pilot communities, enthusiastically supports the master planning process. Patrick Ward, Commissioner of Public Health and Safety in Springfield, said that during the 18-month planning process the city officials learned more about their fire protection delivery system than they thought there was to know. An important discovery was that a



fire department does not operate in a vacuum nor solely function to suppress fires. The fire department's interdependence upon other agencies, both public and private, became apparent.

Important lessons learned during the process concerned vital yet often neglected functions other than fire suppression namely, life safety/paramedical services, regional coordination, data development, fire safety education, deteriorated building hazards, and community relations.

Commissioner Ward defines master planning as "fire loss management" and said that among its rewards are placing planning for the future on sound footing, making it easier to defend budget requests, bringing top level local government officials into the community's fire protection system, defining the capabilities and responsibilities of the fire department in emergency situations, and redesigning firefighters' jobs to make them more productive to the public and more rewarding for themselves.

Springfield's master plan has another important effect in the reduction of fire losses. In 1975 and 1976 Springfield's fire loss reduction figures were down 54 percent and 18 percent, respectively.

To gain a "third-party" opinion of the master planning process, the International City Management Association and representatives of communities near the validation cities participated in an assessment of the *Urban Guide's* usefulness. The ICMA formed teams of city administrators who visited the pilot communities to determine the transferability of NFPCA's master planning tools. Their conclusion was positive.

The ICMA also observed that "Master planning's total 're-think' about community fire protection tends to foster a more equitable distribution of responsibilities and costs between the public and private sectors." The ICMA presented its findings in "Assessment of the Transferability of the Community Fire Master Planning Program." (See Bibliography.)

#### **Assisting Small Communities and Rural Areas**

The *Urban Guide* is suited for large cities, major metropolitan areas, and complex

environments. To serve smaller communities, rural areas, and less complex city environments, the National Fire Safety and Research Office produced the *Basic Guide for Fire Prevention and Control Master Planning*. (See Bibliography.) Completed in July 1977, this is a simplified version of the key concepts and procedures of master planning.

The *Basic Guide* was developed under an NFPCA grant to the Oklahoma State Fire Marshal's Office. Fourteen communities were chosen from among the 150 which volunteered to test the process. They include both counties and regions, incorporated and unincorporated areas. The 14 volunteers are: Benton County, Ark.; Clarendon County, S.C.; Devils Lake, N.D.; Flagstaff, Ariz.; Forest Grove, Ore.; Gdfrey Fire Protection District, Ill.; Longmont Fire Protection District, Colo.; Madeira Beach, Fla.; Northwest Missouri Regional Council of Governments; Princeton, Mass.; Seymour, Tenn.; South Charleston, Ohio; Springlake Fire Protection District, Calif.; and Williamsburg, Pa.

Five counties in the northwest corner of Missouri have developed a regional master plan through their Regional Council of Governments. As one of the areas which pilot tested the *Basic Guide*, it was the only one to include five county jurisdictions. In the five counties are 42 communities, 37 fire departments, and 300 fire personnel. The plan, produced by a 20-member team, presents the region's problems along with proposed solutions and realistic cost estimates and methods for obtaining financing.

The regional council and planning team hope the plan will result in improved fire

services and reduced loss of life and property. One immediate result of the plan was fire education programs for children, the elderly and the handicapped.

In South Charleston, Ohio, the plan was less complex, involving one town rather than five counties. During the planning local officials claim they did not learn "anything new;" however, they are looking at things differently. Fire protection is no longer an isolated function, but a system of services ranging from increased needs for accurate data collection to new legislation.

In the area of data South Charleston participates with the State of Ohio in the National Fire Incident Reporting System. According to 1977 statistics, that town's fire department made 55 runs—more than ever before. Fire Chief Roger Giffin acknowledged he was not sure whether there were actually more fires than before but that better records were being kept. Better data has helped the South Charleston Fire Department with its master planning. Said Chief Giffin, "We began to clearly see the need for efforts in the field of public education, particularly for smoke detectors."

Legislation is another area influenced by the master plan developed in this Ohio community. Initiating emergency medical services and adopting a life safety code are two areas in which the Chief hopes to see legislation enacted.

#### **Training for Master Planning**

Training in the use of master planning techniques was an important NFPCA activity in 1977. The National Fire Academy is responsible for this outreach aspect of master planning.

The National Fire Academy developed two master planning courses during 1977. The first, "Overview of Master Planning," introduces course participants to the purpose, language, procedure, costs and benefits of master planning. In 1977 980 local fire service personnel and local government officials in 12 states attended this course.

The second course, "Preparation for Master Planning," readies local government planning team leaders to carry out their roles in master planning. The method of training these leaders is a "hands-on" workshop simulating a planning

team environment. The course was pilot tested in California in June. By late 1977 student nominations from cities committed to master planning were arriving at NFPCA. These nominations will determine interest centers for selecting locations for course delivery during 1978.

Meanwhile, the Public Education Office continued to train local fire educators in systematic planning techniques which were developed specifically for public fire education. These techniques help local fire educators more effectively plan, develop, implement, and evaluate targeted public fire education

programs. During 1977 local fire educators participated in regional public education planning programs held in 11 states. By the end of 1977 *Public Fire Education Planning*, a step-by-step manual for fire educators, reached the final stages of development.



# ARSON



**Issue: The need to conquer arson.**

## BACKGROUND

The Symphony Road neighborhood in Boston is known for two primary characteristics: its closeness to the Boston Symphony and arson. In other cities across the Nation, from Seattle to the South Bronx, arson has become an epidemic.

In Ohio and California, the first states to join the NFPCA's National Fire Incident Reporting System, incendiary and suspicious fires are the *leading* cause of property loss in buildings. These fires cause about 20 percent of the known residential dollar loss and almost 36 percent of the known losses in non-residential buildings in those states. An estimated 25 percent of all fires in the Nation today are the work of the arsonist.

Arson, however, is a complex issue of tremendous scope. Criminal involvement, human behavior, social change, business and economic trends and the nature of fire contribute to arson's attack on the cities. The arsonists' motives range from those arising from mental disturbance to arson-for-profit. Finally, the responsibility for stopping arson does not rest solely with the fire service nor the police. Arson is a crime that crosses organizational barriers and requires broad-based countermeasures for solution.

At the National Fire Administration, arson program development is based largely on recommendations in "Arson: America's Malignant Crime." (See Bibliography.) Achievements ranged from providing technical assistance allowing local communities to stop arson before it starts, to coping (through training and



information) with arson when it happens.

## ACCOMPLISHMENTS

### Stopping Arson Before it Happens

In October 1977 Boston headlines announced the arrests of 26 alleged members of an arson ring operating in neighborhoods near the Boston Symphony. Information contributing to the breakup of this ring came from a Boston community group, the Symphony Tenants Organizing Project (STOP), with technical assistance from the Administration's Public Education Office. This assistance helped Boston residents take advantage of extensive socio-economic studies performed on urban fire problems by PEO. The result of this effort is an early warning system which monitors factors such as inflated property values, cost to mortgage ratios and property conveyances. The system has been used to forecast arson with a high degree of reliability.

Since the breakup of the Boston ring, the Department of Commerce's Economic Development Administration has agreed to fund a program to develop a Boston-style model community program that can be transferred to other communities around the Nation. The model program will focus on housing services and insurance rehabilitation and is scheduled to begin in 1978.

Adults are not alone in deliberately setting fires, as many fire investigators know. Juvenile firesetters are major contributors. Education programs to prevent juvenile fire setting, coupled with counseling programs for known juvenile fire setters, can measurably reduce this toll.

For example, an education and counseling program developed by the Los Angeles County Fire Department was presented to 196,000 students in 420 schools over a 3-year period. The number of fire incidents involving juveniles dropped from 169 to 12 at the end of the program. There were no repeat offenders. The Public Education Office sponsored a 1977 grant to document and evaluate this and other successful programs for youthful firesetters. The result will be a practical guide for local fire departments to use in dealing with juvenile firesetters in their communities.

### Assistance When Arson Strikes

The NFPCA also concentrated on building the skills of those who confront arson when it happens. For example, the National Fire Academy co-sponsored seminars for practicing arson investigators in two regions of the United States. These seminars reached 150 investigators; courses in an additional 10 locations are planned for 1978.

In addition, NFPCA staff members participated in arson

programs sponsored by other organizations. They reached a total of 975 students through these programs.

In another effort the Fire Reference Service of the Data Center brought the total items in its arson information collection to more than 800 in 1977. Gathered from a variety of sources and abstracted for easy reference, this is one of the most comprehensive collections of arson information in existence. Arson investigators can use the collection to learn about the latest investigative techniques and programs. A bibliography of the collection was being compiled in late 1977.

Development of a model fire/arson investigation training course neared completion in 1977. The completed course package will include a job description of the fire/arson investigator, major topic and course outlines, delivery systems, instructor qualifications, and evaluation systems for the program. This 80-hour course will be offered beginning in April 1978; a 24-hour course in arson detection will be available in July 1978. (See Chapter 6 for details of these courses.) The goal is more arson arrests and convictions.

# EDUCATION AND TRAINING

**Issue: The need for improved education and training for the nation's fire community.**

## BACKGROUND

Education and training are key to advancement in most occupations, including the fire service but for the firefighter, education and training are vitally important. New skills and knowledge can contribute to the firefighter's personal safety, and—through reduced loss—to the well-being of the Nation.

The National Fire Academy's goal is to advance the professionalism of the fire services and others engaged in fire protection. The programs of the Academy toward this goal are developed on a participative basis with state and local fire interests. Major Academy efforts revolve around course development, including educational research and evaluation, and the development of education delivery systems.

## ACCOMPLISHMENTS

### Progress in Course Development

By the end of 1977, 10 courses were in various phases of development, from initial studies to delivery of pilot programs. Approximately one dozen additional courses are scheduled for delivery within the next four years. Following is a discussion of the status of the 10 courses as of late December 1977. They are part of the Academy's 'outreach' system and will be delivered in 1978 on the state and local level.

*Fire/Arson Investigation:* 80-hour course for fire and law enforcement personnel. Developed under an NFPCA

grant to Lincoln Land College in Springfield, Ill., course topics include determining the point of fire origin, forensic laboratory services, rules of evidence, and testimony. The course has been pilot-tested and course materials are complete. The first course is scheduled for April 1978.

*Arson Detection:* 24-hour course designed for operational fire service personnel. Fire behavior, motivation of the firesetter, evidence collection and presentation, and legal aspects of arson are among the course topics. The first course is scheduled for July 1978.

*Fire Instructor Development:* 40-hour course to improve and develop fire service instructors on state and local levels. In 1977 the preliminary curriculum guidelines, directed toward satisfying Standard 1041 of the National Fire Protection Association, were developed. By late December the Instructor's Handbook, Student Workbook, and visual aids were completed. The first course will be held in early January 1978.

*Fire Safety for Practicing Architects:* 30-hour course for architects and interior designers. The course objective is to enable architects and interior designers to create more firesafe environments. The course will acquaint architects and designers with design deficiencies contributing to destructive fires, and the ways in which design decisions impact on building safety. The course package was developed in 1977; and four seminars, reaching 128 students, were held. Four pilot presentations of the full 30-hour course are scheduled beginning in April 1978.

*Labor/Management Relations for the Fire Service:* 40-hour course for current and

prospective fire service managers. In May 1977 the Academy held a seminar for 85 fire chiefs to discuss problems, trends and types of programs which can benefit them. In August, a contract was signed for the modification of a course designed by the U.S. Civil Service Commission on labor relations for public managers. At the end of 1977 the Academy was reviewing the first draft of the program and scheduled the first pilot program for January 1978.

*Overview of Master Planning:* 1- or 3-hour presentations for fire officers, government administrators and elected officials on master planning for fire prevention and control. Developed under contract in early 1977, this introductory course had been presented 16 times to a total of 980 students by November 1977.

*Preparation for Master Planning:* 40-hour course for members of planning teams from communities committed to master planning and for college and university staffs teaching master planning. In early 1977 a contract was awarded for the development of a course to train local planning personnel in the principles and practices of master planning techniques. In June 1977 a pilot program was held in California for 25 students. By December 1977 nominations for students were being received from cities already committed to master planning. These nominations will determine scheduling and locations for 1978 course delivery.

*National Fire Incident Reporting System (NFIRS):* 24-hour course for state and local personnel involved in the NFIRS program. The Academy and National Fire Data Center jointly developed this

instructors/users package during the past year. A total of 185 students in nine states completed the course in 1977. These students will train others throughout their own states using the NFIRS course package.

**Management Overview for Fire Service Officers:** 20-hour course for fire service middle managers. The New York Association of Fire Chiefs was awarded a six-month grant for the development of this "short course." Emphasis is placed on the smaller paid and volunteer departments. February 1978 will mark course implementation.

**Hazardous Materials/Pesticide Fire and Spill Control:** 16-hour course to equip firefighters and fire officers with the necessary expertise to cope with hazardous pesticide incidents. The Fire Academy and the Environmental Protection Agency jointly developed this course in 1977. A course package of audio tapes, instructors' manuals and student handbook was pilot tested in November. Courses will begin in March 1978.

The Public Education Office and the Academy began a project to develop courses for training public fire education specialists in 1977 through a grant to the International Society of Fire Service Instructors (ISFSI). That organization has begun development of a comprehensive training package for public education specialists. The final package, which will consist of three separate courses, will be delivered in each of the 10 Federal regions before 2,000 fire service representatives in 1979.

Through a grant to the International Association of Fire Chiefs Foundation, the Academy also began a program

to provide information and direction for the preparation of an Executive Development course series. As presently conceived, this series will provide for the development of management skills for company-level fire officers, middle management chiefs and senior-level chief officers. The middle management and



senior-level segments will be offered at the central Academy facility in Washington, D.C.

#### **Establishing Educational Delivery Systems**

The "pay-off" for course development is delivery. Since the fire service is a relatively fragmented community, effective delivery systems are essential.

The campus of the former Marjorie Webster Junior College in Washington, D.C., was recommended by a Site Selection Board and selected by the Secretary of Commerce as the site for the National Fire Academy in late 1976. The National Fire Administration purchased the 8.5-acre campus in May 1977 for \$2.6 million. A qualified architectural firm is developing the detailed space plan and renovation cost estimate. The Academy campus



renovation however, cannot be completed prior to mid-1980.

The campus will serve as the hub of the Academy delivery system where fire service executives and the technicians who confront special problems (such as arson and hazardous materials) will attend class. Emphasis will be on "training trainers" who will return home to present similar courses in their own communities. The "multiplier effect" of training these local leaders and teachers will significantly increase course impact.

The campus, however, is only one of many sites for education and training. While delivery systems are being established under the Academy Planning Assistance Program, NFPCA developed interim arrangements for local courses through a series of regional meetings with state and local officials. (See Chapter 8 for a detailed discussion of the Academy Planning Assistance Program.) In late 1977 300 participants at meetings in each of the 10 Federal regions worked with Academy staff to agree on dates, times and procedures for the delivery of courses. As a result of those meetings, 45 states have scheduled courses for 1978 delivery. Students representing every state will attend.

#### **'Open Learning,' Accreditation and Future Directions**

Earning a baccalaureate degree in fire-related subjects is a problem for many people. The academic discipline of fire is an emerging one, and currently only 17 institutions of higher learning in the United States offer 4-year degree programs in fire-related subjects. Often these few programs do not mesh well with the firefighter's duty hours.

To search for a possible solution to these problems, the Academy awarded a grant to the International Association of Fire Fighters (IAFF) to investigate the "open learning" concept of non-traditional, non-campus education for firefighters. IAFF has begun identifying the educational needs of the fire service, analyzing existing higher education opportunities, and determining the feasibility of a national, flexible learning program for the fire service. An Academic Advisory Board, a group of nationally known educators and members of the fire service community, provides overall project guidance.

If the IAFF study finds the flexible open-learning concept feasible, three other phases may be undertaken: curriculum development and program testing, evaluation, and implementation.

The Academy is also studying the need for an accreditation mechanism for existing fire training and education programs. Presently, no such mechanism exists. Created by the Federal Fire Prevention and Control Act of 1974, the Advisory Committee on Fire Training and Education met in Seattle, Wash., St. Louis, Mo. and twice in Washington, D.C., to discuss this need in 1977. At a January 1978 meeting in New Orleans, the Committee will discuss their initial findings, including recommendations for the Academy's role in accreditation.

Another study, conducted under grant to the Far West Laboratory for Educational Research and Development will influence the Academy's future directions. The report, "A Study on the Development of Programs for the National Academy for Fire Prevention and Control," was completed

in 1977. (See Bibliography.) The main task areas of this study involved:

- formulating training and education (T&E) requirements for fire prevention and control in the United States,
- reviewing available documents and expert opinion regarding the adequacy of existing T&E efforts in fire prevention and control,
- identifying appropriate target groups for T&E and characterizing their needs,
- developing a generic model for the National Fire Academy,
- identifying the range of alternative programs that the Academy might establish,
- formulating criteria by which to evaluate these alternatives,
- identifying the most cost-beneficial and promising of the Academy alternatives.

Given the large number and wide dispersion of fire departments in the U.S., the report suggests that the bulk of the Academy's T&E effort should be devoted to the development of an outreach system whereby the Academy could have a beneficial impact on the T&E conducted in fire departments, state and metropolitan T&E programs, community colleges, universities, and other T&E facilities. Secondly, the report recommends that the Academy provide additional training with its own teaching faculty, both in the field and at a central residential facility.

# BASIC RESEARCH

**Issue: The need for a basic understanding of fire and its effects.**

## BACKGROUND

Fire has been surrounded by an aura of mystery since pre-historic times.

Scientists and engineers have solved some of fire's mystery—the mechanisms of ignition, fire growth and spread, detection and suppression techniques and the effect of smoke on people. Yet, basic questions still remain: What toxins does smoke contain? How do different materials behave in fires? What are the lessons of past fires?

The answers to these technical questions have important public policy implications. For example, a fire code defines an acceptable level of fire risk for a community. Adopting a code is not only a technical decision; it represents a community's fire policy.

The Center for Fire Research at the National Bureau of Standards (NBS) uses scientific and engineering expertise to answer these and other technical questions. The Center's research strategy is to intervene in fire's chain of events to prevent ignition, to control fire's growth and spread, to detect and suppress fires, and to protect people from the effects of fire. The result of research is technical information to the fire community. These take the form of recommendations for improved test methods, building and fire codes, and fire protection practices. The Center performs this work in its own laboratories and supports other research efforts through an extensive grant program. The principal Federal fire laboratory, the Center is internationally

recognized for its contributions to a basic understanding of the causes and effects of unwanted fire.

## ACCOMPLISHMENTS

### Controlling the Hazards of Smoke

Smoke inhalation, not exposure to flame, is the largest contributor to fire death. While the toxicity of combustion products (smoke particles, gases and airborne liquids) has long been recognized, 1977 marked an important first step in solving the problem of toxicity. Working with industry and universities, CFR scientists developed a prototype test method to identify materials which produce extraordinarily toxic products when burned. In early 1978 other laboratories will begin using the new test method to assure its reproducibility. Eventually manufacturers may use the test to measure the potential toxicity of their own proposed products, long before they reach the marketplace.

Smoke detectors are an effective defense against the hazards of home fires. The first standard developed exclusively for home smoke detectors was published by Underwriters Laboratories, the Nation's largest testing laboratory, as UL 217 in 1977. The standard is based on CFR technical findings from a joint CFR/UL project. This standard helps the consumer to be assured of a quality product.

Once purchased, smoke detectors should be properly installed for maximum protection. The release of Phase I and Phase II of the "Detector Sensitivity and Siting Requirements for Dwellings" reports presented improved location data. The same information was also included in the Administration's 5-part



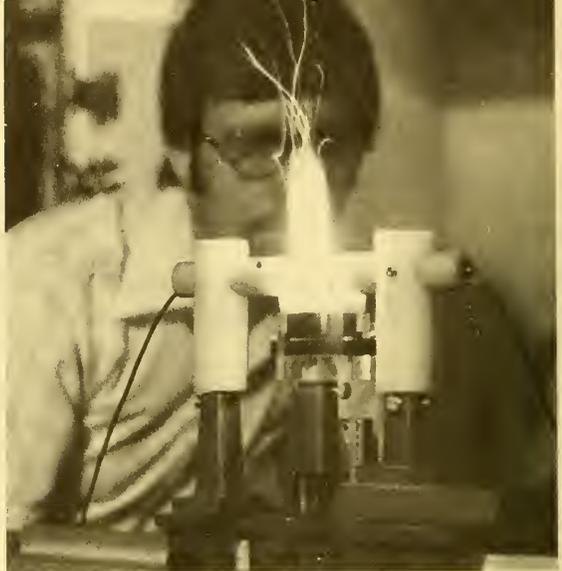
series of smoke detector public education manuals (discussed in Chapter 2).

The effect of smoke on people also received attention through two CFR-sponsored projects during the year. Detailed post-incident investigations of fire deaths performed under a grant to Johns Hopkins University identified the exact cause of fire death and brought to light the important role which incapacitation plays in fatal fire exposure. A second study highlighted the way smoke influences human behavior in fire. Such research may pinpoint toxic agents which incapacitate victims or which induces erratic behavior and may lead to improved building escape techniques.

#### **The Burning Behavior of Products**

As more homeowners insulate to conserve energy, the fire properties of insulation become more critical to residential fire safety. Center scientists devised new tests for the flammability of attic insulation during 1977. One test simulates small open flame ignition of insulation between floor or attic joists. The second test simulates localized heating of insulation by a recessed lighting fixture, a glowing electrical connection or other hot object. Using results from these tests, CFR has recommended changes in the General Services Administration's Federal specification for insulation. The specification is the basis for purchasing insulation used in Federal buildings and in Federally supported housing. Much of private industry will use the specification and associated test methods as they are perfected.

Prison fires in Columbia, Tenn., and Danbury, Conn., during the year demonstrated the special fire and toxicity



hazards of institutional mattresses. Work begun at the Center for Fire Research in mid-1976 to compare the burning behavior of several commercially available institutional mattresses resulted in a prototype screening test. This work was sponsored in part by the Department of Health, Education and Welfare; the Veterans Administration, the Department of Defense; and the Consumer Product Safety Commission. Using this test, researchers can determine how quickly a room will become untenable after a flaming source of heat ignites the mattress.

This work is also an important part of determining how rapidly heat buildup in a room will cause "flashover:" the state in which a room and its contents are fully involved in flames, and in which very fast firespread, beyond the room of origin, is likely. Delaying and controlling flashover is the key to preventing much of the Nation's fire loss.

#### **Linking Real Fires and Building Codes**

Not all Center research takes

place in a laboratory. Investigations of actual fires identified changes in building codes, material usage or design practices that could have prevented fire loss. Based on these findings, Center staff prepared code revisions for consideration by the Nation's building code organizations. Among the suggested revisions were requirements for fire-stopping in attics and flame-spread ratings for exterior finish materials. These suggested revisions establish a direct link between real fires, engineering analysis, and code revision.

#### **Supporting Outside Research**

In addition to these projects, the Center directs a major program of contracts and grants supporting the fire research at universities and other research institutions throughout the United States. Like the research conducted at the Center, these programs result in new data on fire's "pressure points" of ignition, growth and spread, detection and suppression, and human protection. During 1977 the Center directed 36 separate projects in outside research laboratories funded at \$2.1 million.

# ASSISTANCE FOR STATE AND LOCAL GOVERNMENTS

**Issue: The need to provide assistance to state and local governments.**

## BACKGROUND

The National Fire Administration cannot act alone to reduce America's fire loss nor can states and communities solve the problem independently. Through a cooperative effort involving Federal support for state and local programs, a better understanding of the fire problem and a reduction of fire losses can be achieved.

During 1977 the Administration targeted several assistance programs at states, benefiting local governments as well. Helping states build their capacity to develop and deliver programs was a major Administration-wide goal.

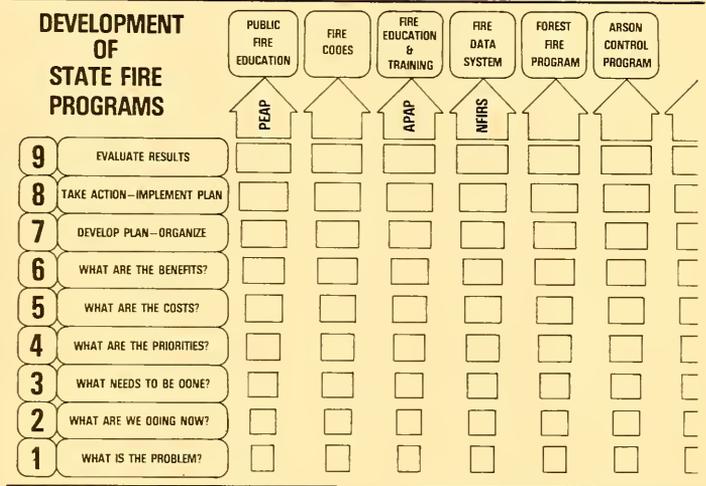
Four "grants-to-states" programs are in various stages of implementation by NFPCA:

- PDAP—Policy Development Assistance Program
- APAP—Academy Planning Assistance Program
- NFIRS—National Fire Incident Reporting System
- PEAP—Public Education Assistance Program.

These grants-to-states are intended to assist and to reinforce the efforts of local fire personnel, as well as state level agencies. The 2 million local fire personnel represent the primary force for reducing fire loss. For this reason, local fire service participation and involvement of local interest groups are vital to state grant programs.

The planning chart, Figure 5, illustrates the nine basic steps in the planning process for each state-oriented Administration grant. Each of the four programs discussed here refers to that chart.

Figure 5



## ACCOMPLISHMENTS

### Policy Development Assistance Program

The fire prevention and control master planning programs discussed in Chapter 4 are designed for local governments. However, the principles and techniques of master planning can be applied to state governments as well. By the end of 1977, a program to transfer these concepts to state-level activities had reached the final planning stages. Under the Policy Development Assistance Program (PDAP), four grants will be issued in early 1978 which will test this process on the delivery of state government fire prevention and control services.

Under a PDAP grant a state will demonstrate how it can analyze its priority needs and integrate the fire prevention and control services of state agencies into a coordinated, well-balanced attack on the

state's fire problem. These projects are expected to result in model methods which other states can adapt to their needs.

Steps One through Seven of the planning process would be completed under PDAP. The final two steps are the responsibility of the states.

### Academy Planning Assistance Program

Assisting states to develop a systematic educational delivery system is the reason behind APAP, the Academy Planning Assistance Program. This system in each state will also become a vital part of the National Fire Academy's outreach effort.

APAP focuses on fire education and training programs through a 2-part grant program. The "organizational design" phase supports state identification and analysis of existing state and local institutions, organizations and agencies able to deliver fire training and education. In

addition, states select the responsible entity for planning statewide fire service education and training. These activities encompass Steps One and Two of the planning process shown in Figure 5.

In the second phase of APAP, the Administration supports a state's effort to develop a comprehensive 5-year plan for fire education and training, outlined in Steps Three through Seven.

In developing its 5-year plan for education and training, the State of Oregon devised lists of specific priorities: three major "needs" were related to fire service education and three were targeted toward public fire education. (Each list contained more entries than the three major points.) Here are Oregon's three major fire education "needs:"

- 1) Oregon needs: "improved fire safety education and training for fire service administrative personnel" was listed first under fire service education. Three separate programs which would be implemented over the next five years were presented as measures to help meet that first "need."
- 2) Oregon needs: "trained training instructors especially at the recruit and in-service levels." To meet this need, the 5-year plan set forth two separate programs to be undertaken in the next five years.
- 3) Oregon needs: "improved and intensified basic training at both the recruit and in-service levels." Three additional programs to meet this "need" were presented.

Thus far, APAP grants have been issued to 26 states (see Figure 6). The Administration expects the APAP program to continue until all interested states and territories have developed their 5-year plans for fire education and training. These plans not only help state and local governments but also



help the National Fire Academy more clearly define the needs it can meet through its outreach system.

### National Fire Incident Reporting System

The National Fire Incident Reporting System (NFIRS), discussed in detail in Chapter 1, is another significant Administration effort to assist states and local communities. As under PDAP and APAP, the NFIRS program encourages participation by state interest groups.

The NFIRS assistance program helps states through all nine of the planning steps. However, most of the resources are normally invested in Step Eight: "Take Action" (implementing the system). The Administration also provides substantial technical assistance, along with financial support for statewide data collection.

### Public Education Assistance Program

The Public Education Office has seen that public education programs can result in a dramatic, measurable impact

on fire loss. To assist states in establishing and expanding their public education efforts, PEO designed the Public Education Assistant Program—PEAP.

Under PEAP, the Administration helps build a state's capacity to provide local fire educators with access to programs, materials and technical assistance for planning, implementing and evaluating targeted community fire education programs. The resulting state program should achieve three objectives:

- To make a state public fire education program part of the state fire structure;
- To provide local community educators with fire education program information and materials;
- To develop the ability of communities to plan, implement and evaluate effective public fire education programs.

As with other state-targeted NFPCA grants, PEAP provides both financial and technical assistance, and is designed to involve a variety of interest groups in the program. The

Figure 6

Academy Planning Assistance Program



majority of funds allocated for PEAP are aimed at Steps Eight and Nine of the planning process: implementation and evaluation.

Four states—California, Delaware, Illinois and Oregon—are now pilot testing PEAP. (See Figure 7.) At least two other states will be added in early 1978.

California, for example, is using its \$15,000 grant to establish resource centers which will identify public education programs and resources within the state, and provide local fire departments with access to these materials. Fire educators will also find assistance in program planning, implementation and evaluation from the centers. Regional state workshops will be held to gather and disseminate programs and materials and to provide training in systematic planning to educators.

Developing a state resource system is seen as a 3-year process. In addition to the initial grant, funds may be awarded for two subsequent years at a reduced rate. Each state assumes the full responsibility for the program in three years.

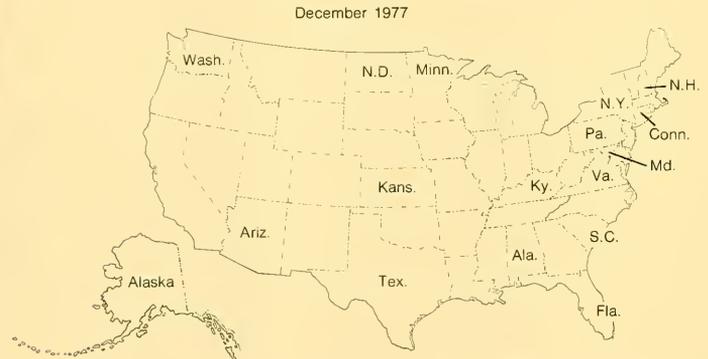
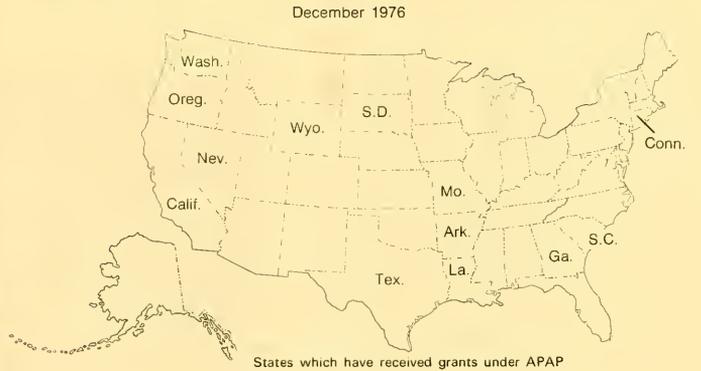


Figure 7

Public Education Assistance Program



# THE FEDERAL FOCUS

**Issue: The need to provide a focus for Federal fire activities.**

## BACKGROUND

Fire protection is a concern other Federal agencies share with the NFPCA. Many of these other agency programs are part of a larger mission (such as national defense, improved health care, housing or consumer safety). Nonetheless, there is a need to coordinate all Federal fire safety efforts to assure an orderly program for reduced fire loss. Congress recognized this need by directing the NFPCA to work with other Federal agencies in furthering the objective of reducing fire loss in a cost-effective fashion.

As a result of this mandate, NFPCA has designed its interagency coordination programs to begin meeting three basic needs:

1. to provide other Federal agencies with the type of assistance given to state and local governments;
2. to avoid duplication among Federal fire programs; and
3. to work toward integrating Federal fire programs into the overall plan to meet national needs and develop a national fire policy.

The tool to fulfill these needs is communication. The NFPCA informs approximately 65 agencies of new developments, publications and seminars. Staff members also coordinate the activities of several Federal task groups using multidisciplinary expertise to attack common problems. The NFPCA is also a cooperating member of the National Wildfire Coordinating Group to bridge the gap between structural and forestry interests.

Interagency coordination resulted in significant savings of Federal dollars in 1977.

## ACCOMPLISHMENTS

Mobile fire apparatus represents a significant investment for fire protection on Federal property. Although most agencies need this protection, many do not have the expertise to develop specifications for acceptable units. To assist in standardizing equipment and lowering per unit costs, NFPCA distributed a Navy-developed purchase specification for pumpers and aerial ladder trucks to other agencies in 1977. As a result, NASA, ERDA, and the Department of the Interior are "riding" the Navy's purchase order. The delivery time for their new apparatus has been reduced by as much as 24 months; a savings of up to \$10,000 per vehicle has been achieved. Standardization efforts will continue in 1978.

Federal fire reporting also improved as the result of NFPCA initiatives in 1977. Through an interagency transfer of funds to the Department of the Navy, a recommended fire reporting and statistical system for all Federal agencies was developed. At least a dozen agencies have expressed interest in implementing this NFIRS-compatible system during 1978.

In a similar effort, the Department of Housing and Urban Development agreed to rely on NFPCA to collect and analyze fire data needed to evaluate HUD's mandatory mobile home fire safety standard. The results are uniform data collection, more valid statistics, reduced burden on state and local officials and reduced cost. HUD has also funded an interagency agreement for the National

Fire Administration to establish a system of in-depth investigation of mobile home fires using local officials. (See Chapter 1.) Based on loss experience, the Mobile Home Safety Standard enforced by HUD can be evaluated.

Staff members provided expert fire safety assistance to roughly a dozen agencies during the year. These consulting efforts ranged from residential fire safety on Indian reservations to mandatory fire protection training for merchant seamen. An agreement to implement close cooperation with the National Institute for Occupational Safety and



Health was also signed during the year. NFPCA plans to intensify efforts of coordination and cooperation with agencies with fire protection responsibilities.

## OTHER ADMINISTRATION CONCERNS

In addition to the tasks described in this Report, the Federal Fire Prevention and Control Act of 1974 made the National Fire Administration responsible for reimbursing local fire departments for fighting fires on property under Federal control, for conducting a national conference, and for administering awards created by the Act.

### **Reimbursement for Fighting Fires on Property Under Federal Control**

Under Section 11 of the Act, the Administration's Office of Chief Counsel is responsible for the reimbursement program for fighting fires on property under Federal jurisdiction. The fire service can claim the direct costs and losses incurred in fighting such fires. After a claim is made and the amount payable determined, the fire organization making the claim is notified. If that amount is considered acceptable, the Administration will request the U.S. Department of the Treasury to make the payment.

On July 18, 1977, the Administration issued the final regulations governing the submission and determination of claims made under this program: "Federal Register," Part III, Vol. 42, No. 137. (See Bibliography.) From mid-July to December 16, 1977, 46 claims totaling more than \$1.2 million were filled. The smallest claim amounted to \$4; the largest was \$650,000.

### **National Conference**

An ongoing, vigorous program to foster and encourage a closer relationship among all fire interest groups is underway on many fronts. Among its tasks, the Administration sponsors, co-hosts and participates in a variety of fire-related professional events. Of these,



the Administration's national conference is the most vital.

"Policy Leadership in Fire Protection" was the theme of the NFPCA's Third Annual Conference. Held in St. Louis in October 1977, it brought together many of the nation's policymakers—mayors, city councilmembers, county supervisors, state legislators, corporate officials, labor leaders—with the fire community.

Through active participation by almost 1,000 members of these groups, the NFPCA opened the way for discussions on mutual problems and helped open avenues leading toward better understanding.

The 3-day conference focused on six major issues: policy issues in fire protection; policy issues associated with the built environment; policy issues in fire prevention; policy issues in fire suppression; dealing with policy problems in fire protection leadership; and resolving policy issues—or, "what to do when you get home."

In addition to the annual conference, NFPCA's emphasis on assisting state and local fire officials resulted in other important work sessions and conference reports during the year. In January 1977, the Administration released "Recommendations on the Relationship Between the National Fire Prevention and Control Administration and the State-Level Fire Community," (See Bibliography.) which summarized a working session with the State Directors of Fire Training (or equivalents) from 45 states. This conference was conducted by the International Society of Fire Service Instructors.

In February 1977 a similar work session was held with the State Fire Marshals (or equivalents) from 49 states. (See

Bibliography.) This conference was conducted by the Fire Marshals Association of North America and its parent National Fire Protection Association. Both conferences resulted, at least in part, from the April 1976 edition of FIREWORD, the NFPCA newsletter, which was devoted to the "state fire focus" concept. After that issue of FIREWORD was distributed, each organization asked NFPCA to support a conference to examine this concept and other issues of mutual concern.

While many issues were discussed at these two meetings, the Administration was particularly interested in the participants' views on three key questions: Is there a need for a state-level fire prevention and control focal point? Is interest group participation necessary? And, what should the role of the focal point be? Responses from both groups showed many similarities. For example, both shared the belief in a single, state fire focal point, and in the need for interest group participation. And both groups expressed the idea that the role of the state focal point should depend on the specific needs of a state.

Recommendations from the February meeting are published in the "State Fire Marshals Conference Report: Recommendations on Federal and State Roles in the Fight Against Fire." (See Bibliography.)

### **Public Safety Awards**

Section 15 of the Act creates the President's Award for Outstanding Public Safety Service and the Secretary's Award for Distinguished Public Safety Service, both to be administered by the NFPCA. Firefighters, law enforcement officers including corrections

and court officers, and civil defense officers are eligible for the awards.

The Departments of Commerce, Defense, and Justice issued joint regulations for the two awards on September 30, 1977: "Federal Register," Vol. 12, No. 190, September 30, 1977. (See Bibliography.) Members of a Joint Public Safety Board, responsible for assisting the Secretaries of Commerce and Defense and the Attorney General implement Section 15, were being selected at the end of 1977. On January 1, 1978, the NFPCA was to begin accepting nominations for the awards.

# SELECTED 1977 ACCOMPLISHMENTS

## NATIONAL FIRE DATA CENTER

- The National Fire Incident Reporting System (NFIRS) grew to 19 states.
- NFIRS training package (including student workbook, instructor's guide, audiovisual aids and evaluation materials) was developed for participating states and local jurisdictions.
- Nine states hosted NFIRS training sessions.
- Participants in two workshops established an NFIRS users group.
- An updated NFIRS computer software package became available for use.
- "Fire in the United States," a detailed analysis of fire death, injury and loss statistics, was completed.
- "Fire Service Physical Fitness Programs" was published.
- The Southgate, Ky., Beverly Hills Supper Club disaster, mobile homes and 10 consumer products were subject for in-depth investigations.
- A report on "Fire Deaths in the United States" was completed.
- A collection of approximately 800 items on arson was established.
- Bi-monthly publication of "Fire Technology Abstracts" began.

## NATIONAL ACADEMY FOR FIRE PREVENTION AND CONTROL

- Ten separate courses for 1978 delivery were under development:
  1. Arson Detection
  2. Fire/Arson Investigation
  3. Fire Instructor Development
  4. Fire Safe Building

Design for Practicing Architects

5. Hazardous Materials/Pesticide Fire and Spill Control
  6. Labor/Management Relations for the Fire Service
  7. Management Overview for the Fire Service Officer
  8. National Fire Incident Reporting System
  9. Overview of Master Planning.
  10. Preparation for Master Planning.
- At meetings in each of the 10 Federal regions, state and local officials and Academy staff scheduled course delivery for 1978.
  - 45 states agreed to host Academy courses in 1978.
  - 26 states participated in the Academy Planning Assistance Program.
  - Two regional seminars co-sponsored by the Academy reached 350 practicing arson investigators; staff instructed 975 participants in locally-sponsored seminars on arson.
  - Master planning was introduced to 980 fire service personnel and local government decisionmakers in 12 states.
  - "A Study of the Relationship of the National Fire Academy to the Fire-Related Education Programs in Colleges and Universities" identified and analyzed the needs of target fire service audiences and available education programs.
  - The Advisory Committee on Fire Training and Education discussed the desirability of accreditation of existing fire education and training programs; a

report is expected in early 1978.

- The Far West Laboratory report analyzed the costs and benefits of alternative Academy educational delivery systems and recommended optimum configurations.

## NATIONAL BUREAU OF STANDARDS/CENTER FOR FIRE RESEARCH

- After flammability testing of insulation used in residential attics, walls and basements, Center staff suggested revisions in the General Services Administration's insulation purchase specification.
- Based mainly on Center findings, Underwriters Laboratories adopted a



new standard, UL 217, for residential smoke detectors.

- A prototype test method to measure the toxicity of burning materials was developed.
- A new technique to determine the total rate of heat production in a room fire test was developed.
- A report on the probable growth and spread of the Beverly Hills Supper Club fire was prepared after an in-depth investigation.
- An ad hoc group on mathematical fire modeling was organized to coordinate modeling activities of CFR, its grantees and other public and private research organizations.
- In a pilot project, the utility of applying decision analysis to fire hazard problems was tested.
- Fire researchers from the academic community, research institutions and CFR participated in a Center-sponsored conference.
- The National Fire Protection Association's Life Safety Committee began reviewing the Center's Fire Safety Evaluation System as an appendix to the Life Safety Code.
- The adiabatic furnace, a potential device for evaluating the autoignition potential of lowgrade coal, was upgraded and refined.

## **PUBLIC EDUCATION OFFICE**

- A 5-volume series of smoke detector public education manuals was published.
- An estimated 5 million copies of "Smoke

Detectors Save Lives" and "Wake Up! Smoke Detectors Can Save Your Life" were distributed.

- A program to train 9,000 local smoke detector specialists nationwide began.
- The National Council on Aging and ACTION/Older Americans Volunteer Program adopted a PEO-sponsored home safety survey training package to prepare senior citizen home surveyors.
- An estimated 800 local representatives received training in systematic planning for public fire education.
- Technical assistance to a Boston-based community group gathering arson information helped lead to the arrest of 26 alleged members of an arson ring.
- The Economic Development Administration agreed to fund a model arson program based on the Boston experience.
- Under PEO grant, the Los Angeles County Fire Department began developing a manual for counseling juvenile firesetters.
- A burn symposium was co-sponsored with the International Association of Fire Fighters.
- Four states began work under the Public Education Assistance Program.
- Six state or regional public education conferences were co-sponsored.
- Approximately 100 fire educators took part in the Third Annual Public Education Planning Conference.
- The International Society of Fire Service Instructors began developing a training package for public education specialists,

under grant from PEO and the National Fire Academy.

## **NATIONAL FIRE SAFETY AND RESEARCH OFFICE**

- The "Urban Guide for Fire Prevention and Control Master Planning" was published and 5,000 copies were distributed.
- Development of the "Basic Guide for Fire Prevention and Control Master Planning" was completed.
- A Master Planning Introduction Package was developed.
- "Fire Insurance: Its Nature and Dynamics" was completed.
- A study on fire research utilization was completed; development of a national fire research policy was begun.
- Six major studies of residential fire suppression and remote alarm systems were completed.
- The Fourth Symposium on Occupational Health and Hazards of the Fire Services was co-sponsored with the International Association of Fire Fighters.
- "Protective Envelope Performance Standards" was published as a basis for improved firefighter protection, the goal of the joint NFPCA/NASA Project FIRES (Firefighters' Integrated Response Equipment System).
- "Job Related Physical Performance Examination for Firefighters" was released.
- "Model Performance Criteria for Structural Firefighters' Helmets" was published.
- "Learning From Fire: A Fire Protection Primer for Architects" was published.

# BIBLIOGRAPHY

*Abstract of the National Survey of Fire Education and Training Programs*

NFPCA, National Fire Academy.

*Arson: America's Malignant Crime*

NFPCA, National Fire Academy. Available through GPO, No. 003-000-00525-9. \$1.50.

*Arson Information Resources: A Baseline Collection and Survey*

NFPCA, prepared by Battelle Memorial Research Institute for the National Fire Data Center. Soon available through NTIS.

*Assessment of the Potential Impact of Fire Protection Systems on Actual Fire Incidents*

NFPCA, prepared by the Applied Physics Laboratory of Johns Hopkins University for the National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Assessment of the Technical Literature on Egress from Buildings, An*

NBS, available through NTIS, No. PB 273 944. \$5.25.

*Assessment of the Transferability of the Community Fire Master Planning Program*

NFPCA, prepared by the International City Management Association for the National Fire Safety and Research Office. Available through ICMA, 1140 Connecticut Ave. NW, Washington, D.C. 20036.

*Basic Guide for Fire Prevention and Control Master Planning*

NFPCA, National Fire Safety and Research Office.

*Catalog of Grants, Contracts and Interagency Transfers*

NFPCA, National Fire Safety and Research Office.

*Combustion of Mattresses Exposed to Flaming Ignition Sources. Part I, Full-Scale Test*

*and Hazard Analysis*

NBS, available through NTIS, No. PB 272 064. \$7.25.

*Considerations in Establishing Performance Criteria for Structural Firefighters' Helmets*

NBS, available through NTIS, No. PB 269 531. \$5.50.

*Control of Smoke Movement in Buildings: A Review*

NBS, available through NTIS, No. PB 269 866. \$4.

This Bibliography contains references to 80 selected publications developed or sponsored by the NFPCA or NBS. They are available as follows:

National Fire Prevention and Control Administration (NFPCA)

P. O. Box 19518  
Washington, D.C. 20036

Superintendent of Documents (GPO)

Government Printing Office (GPO)  
Washington, D.C. 20402

National Technical Information Service (NTIS)  
5285 Port Royal Road  
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National Bureau of Standards (NBS)  
Center for Fire Research  
U.S. Department of Commerce  
Washington, D.C. 20234

For a complete list of publications and reports issued by NBS, write to that division's library.

*Detector Sensitivity and Siting Requirements for Dwellings: Phase II*

NBS, available through NTIS, No. PB 263 882. \$10.

*Determinants of International Differences in Reported Fire Losses*

NFPCA, prepared by the Georgia Institute of Technology for the National Fire Data Center. Soon available through NTIS.

*Development of a Job-Related Physical Performance*

*Examination for Firefighters*  
NFPCA, National Fire Safety and Research Office.

*Development of Low-Cost Residential Sprinkler Protection: A Technical Report*

NFPCA, prepared by Factory Mutual Research Corporation for the National Fire Safety and Research Office.

*Environments of Fire Detectors—Phase I: Effect of Fire Size, Ceiling Height and Materials*

NBS, available through NTIS, No. PB 272 883. \$7.25.

*Feasibility Study of a Nationwide Fire Hotline*

NFPCA, prepared by Mitre Corporation for the National Fire Data Center. Available through NTIS, No. PB 265 653. \$4.50.

*Federal Register*

Part III, Vol. 42, No. 137, July 18, 1977; corrected in Vol. 42, No. 142, July 25, 1977. Available through GPO.

*Federal Register*

Vol. 12, No. 190, Sept. 30, 1977. Available through GPO.

*Fire Deaths in the United States: Review of Data Sources and Range of Estimates*

NFPCA, National Fire Data Center. Available through GPO, No. 003-000-00531-3. \$1.40.

*Fire Education and Training Programs*

NFPCA, National Fire Academy brochure on the 10 courses available for 1978.

*Fire Endurance Tests of Residential Walls Containing Branch Circuit Wiring: Preliminary Findings*

NBS, available through NTIS, No. PB 277 536. \$5.25.

*Fire Fighter Mortality Report*

NBS, prepared by the International Association of Fire Fighters. Available through NTIS, No. PB 253 588. \$8.

*Fire Insurance: Its Nature and Dynamics*

NFPCA, National Fire Safety and Research Office. Soon available through NFSRO.

*Fire in the United States*

NFPCA, National Fire Data Center. Highlights available free from NFPCA. Full report available through GPO. No. 003-000-00537-2.

*Fire Protection Issues and Fire Data Needs*

NFPCA, prepared by Columbia University for the National Fire Data Center. Soon available through NTIS.

*Fire Safety Training Handbook*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00534-8. \$1.40.

*Fire Service Physical Fitness Programs*

NFPCA, prepared by the International Association of Fire Chiefs Foundation for the National Fire Data Center. Available through GPO, No. 003-000-00538-1. \$2.20.

*Fire Technology Abstracts*

NFPCA, National Fire Data Center. Bi-monthly. Available on subscription basis through GPO. \$11.50 per year, U.S.; \$14.50 foreign. For a brochure describing this journal, write the NFPCA.

**FIREWORD**

NFPCA newsletter for the fire service community. To be placed on the mailing list, contact the NFPCA Office of Information Services.

*Fourth Annual Report of the Secretary of Commerce on Implementation of the Federal Fire Prevention and Control Act of 1974*

NFPCA's fourth Annual Report; for calendar 1977. Available through NFPCA.

*Fourth Symposium on Occupational Health and Hazards of the Fire Service*

Symposium sponsored by the

International Association of Fire Fighters and NFPCA's National Fire Safety and Research Office. Write: IAFF, Dr. Ross Attwood, Director of Education, 1750 New York Ave. NW, Washington, D.C. 20006.

*Hazard Characteristics of Combustion Products in Fires: A State-of-the-Art Review*

NBS, available through NTIS, No. PB 268 112. \$4.50.

*Highlights of the National Household Fire Survey*

NFPCA, National Fire Data Center.

*Human Behavior in Institutional Fires and Its Design Implications*

NBS, available through NTIS, No. PB 271 980. \$9.

*Human Factor in High Fire Risk Urban Neighborhoods: A Pilot Study in New Orleans, The*

NFPCA, Public Education Office.

*Impact of a Room Fire on a Corridor with Considerations of Fuel Load, Ventilation and Scaling, The*

NBS, available through NTIS, No. PB 273 942. \$5.25.

*Indirect Losses Arising from Residential Fires*

NFPCA, prepared by Princeton University for the National Fire Data Center. Soon available through NTIS.

*Instrument to Evaluate Installed Smoke Detectors, An*

NBS, available through NTIS, No. PB 278 633. \$4.50.

*Interim Report: Mobile Home Fire Problem in the United States*

NFPCA, National Fire Data Center. Soon available through NTIS.

*Introduction Summary: Fire Prevention and Control Master Planning*

NFPCA, National Fire Safety and Research Office.

*Investigation of Low-Cost Residential Sprinkler Systems: A Summary Report*

NFPCA, prepared by Battelle Memorial Institute for the National Fire Safety and Research Office. Soon available from NFSRO.

*Investigation of the Fire Environment in the ASTM E84 Tunnel Test, An*

NBS, available through GPO, No. SD-C13.10: 46.945. \$2.20.

*Learning From Fire: A Fire Protection Primer for Architects*

NFPCA, prepared by the Architect Life Safety Group, Center for Planning and Development Research, College of Environmental Design, University of California at Berkeley, for the National Fire Safety and Research Office. Soon available through NTIS.

*Low-Cost Residential Sprinkler Systems: Condensed Technical Report*

NFPCA, prepared by Factory Mutual Research Corporation for the National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Model Performance Criteria for Structural Firefighters' Helmets*

NFPCA, National Fire Safety and Research Office.

*Performance Specifications for a Low-Cost Residential Sprinkler System*

NFPCA, prepared by Factory Mutual Research Corporation for the National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Preliminary Report: Analysis of the Mobile Home Fire Situation in the United States*

NFPCA, National Fire Data Center. Soon available through NTIS.

*Preliminary Report on Evaluating Alternatives for Reducing Upholstered Furniture Fire Losses*

NBS, available through NTIS, No. PB 273 943. \$4.50.

*Preliminary Report on the Fire in the Beverly Hills Supper Club: Southgate, Kentucky, May 28, 1977*

NFPCA, National Fire Data Center.

*Proceedings of the Third Conference on Low-Cost Residential Sprinklers: November 29-30, 1977*

NFPCA, National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Protective Envelope Performance Standards*

NFPCA, prepared by the Grumman Corp. for the National Fire Safety and Research Office as an interim report on Project FIRES. Soon available through NFSRO.

*Recommendations on the Relationship Between the National Fire Prevention and Control Administration and the State-Level Fire Community*

Available through NTIS, No. PB 263 799. \$6. Also from the International Society of Fire Service Instructors, P.O. Box 88, Hopkinton, Mass. 01748. \$6.

*Reconstruction of a Tragedy: The Beverly Hills Supper Club Fire*

NFPCA, prepared by the National Fire Protection Association for the National Fire Data Center. Available from NFPA, 470 Atlantic Ave., Boston, Mass. 02210, \$

*Reducing Residential Fire Losses with Automatic Fire Suppression Systems: A Summary Report*

NFPCA, Prepared by Rolf Jensen & Associates, Inc., for the National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Report of the National Academy for Fire Prevention and Control Site Selection Board*  
NFPCA, National Fire Academy.

*Residential Sprinkler Systems Handbook*

NFPCA, prepared by Battelle Memorial Institute for the National Fire Safety and Research Office. Available in autumn from NFSRO.

*Resource Exchange Bulletin*

NFPCA, Public Education Office newsletter. To be placed on the mailing list, contact the NFPCA Public Education Office.

*Reviving the Colonial Spirit of Productivity and Helping One Another*

Report of a Federal Fire Service Seminar. Available from NFPCA.

*Selected Bibliography on Arson*

NFPCA, National Fire Data Center. Soon available through NTIS.

*Smoke Detector Resource Catalog*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00524-1. \$1.70.

*Smoke Detector Technology*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00526-7. \$1.10.

*Smoke Detector Training*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00529-1. \$1.60.

*Smoke Detectors and Legislation*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00527-5. \$2.10.

*Smoke Detectors: Moving the Public*

NFPCA, Public Education Office. Available through GPO, No. 003-000-00523-2. \$1.40.

*Smoke Detectors Save Lives*

Fact sheet on residential smoke detectors prepared by the NFPCA, NBS and the Consumer Product Safety

Commission. Available from NFPCA.

*Sources of Federal Funds for Fire Programs*

NFPCA, Office of Information Services.

*State Fire Marshals Conference Report: Recommendations on Federal and State Roles in the Fight Against Fire*

Available through NTIS, No. PB 272 334. \$6.

Also available through the Fire Marshals Association of North America, Report No. FMC-77. Write: National Fire Protection Association, 470 Atlantic Ave., Boston, Mass. 02210. \$7.50.

*Statistical Analysis of the National Household Fire Survey*

NFPCA, prepared by the University of Wisconsin for the National Fire Data Center. Report, including three supplements, soon available through NTIS.

*Study on the Development of Programs for the National Academy for Fire Prevention and Control*

NFPCA, prepared by the Far West Laboratory for Educational Research and Development, for the National Fire Academy.

*Study of the Relationship of the National Fire Academy to the Fire-Related Education Programs in Colleges and Universities*

NFPCA, prepared by the University of Maryland for the National Fire Academy.

*Study to Establish the Existing Technology for Use in Automatic Fire Suppression Residential Occupancies*

NFPCA, prepared by Rolf Jensen & Associates, Inc., for the National Fire Safety and Research Office. Available in autumn 1978 from NFSRO.

*Summer Fire Safety Tips*

Fact sheet prepared by the NFPCA.

*Survey and Analysis of  
Occupant-Installable Smoke  
Detectors*

NFPCA, prepared by  
Aerospace Corporation for  
the National Fire Safety and  
Research Office.

*Teaching Fire Safety Education*

NFPCA, prepared by the  
Guilford County Fire  
Marshals Office, North  
Carolina, for the Public  
Education Office. Available  
through GPO, No.  
003-000-00535-6. 50¢.

*Thermal Environment during  
Structural Fires*

NFPCA, prepared by the  
Harvard University School of  
Public Health for the  
National Fire Safety and  
Research Office. Summary  
report available through  
NFSRO.

*U.S. Federal Government Fire  
Experience: Fiscal Year 1974*  
Available through NFPCA.

*Urban Guide for Fire Prevention  
and Control Master Planning*  
NFPCA, National Fire Safety  
and Research Office.

*Wake Up! Smoke Detectors  
Can Save Your Life If . . .*  
Brochure on residential  
smoke detectors prepared by  
the NFPCA, NBS and  
Consumer Product Safety  
Commission. Available  
through GPO, No.  
052-003-00261-2. 35¢.

*Winter Fire Safety Tips for the  
Home*

Fact sheet prepared by the  
NFPCA.



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