



U.S. Fire Administration

Fiscal Year 2019 Report to Congress
March 17, 2021



Homeland
Security

Federal Emergency Management Agency

Message from the U.S. Fire Administrator

March 17, 2021

I am pleased to submit the U.S. Fire Administration's (USFA's) Annual Report for Fiscal Year 2019, as required by the *Federal Fire Prevention and Control Act of 1974* (Public Law No. 93-498). The reporting requirement is codified at 15 United States Code § 2215.

This report highlights the achievements of the USFA's activities during the period of Oct. 1, 2018 to Sept. 30, 2019.

The USFA supports the U.S. Department of Homeland Security and Federal Emergency Management Agency missions of preparedness, mitigation, response and recovery through our commitment to support and strengthen fire and emergency medical services and stakeholders through National Fire Academy training activities, public education and awareness initiatives, research and technology development, and data collection and analysis.



Pursuant to congressional requirements, this report can be found at www.usfa.fema.gov and is provided to the following members of Congress:

The Honorable Maria Cantwell
Chairman, U.S. Senate Committee on Commerce, Science, and Transportation

The Honorable Roger Wicker
Ranking Member, U.S. Senate Committee on Commerce, Science, and Transportation

The Honorable Eddie Bernice Johnson
Chair, U.S. House Committee on Science, Space, and Technology

The Honorable Frank Lucas
Ranking Member, U.S. House Committee on Science, Space, and Technology

The Honorable Peter A. DeFazio
Chairman, U.S. House Committee on Transportation and Infrastructure

The Honorable Sam Graves
Ranking Member, U.S. House Committee on Transportation and Infrastructure

The Honorable Rosa L. DeLauro
Chairwoman, U.S. House Committee on Appropriations

The Honorable Kay Granger
Ranking Member, U.S. House Committee on Appropriations

The Honorable Lucille Roybal-Allard
Chairwoman, Subcommittee on Homeland Security
U.S. House Committee on Appropriations

The Honorable Chuck Fleischmann
Ranking Member, Subcommittee on Homeland Security
U.S. House Committee on Appropriations

The Honorable Patrick J. Leahy
Chairman, U.S. Senate Committee on Appropriations

The Honorable Richard C. Shelby
Ranking Member, U.S. Senate Committee on Appropriations

The Honorable Christopher Murphy
Chairman, Subcommittee on Homeland Security
U.S. Senate Committee on Appropriations

The Honorable Shelley Moore Capito
Ranking Member, Subcommittee on Homeland Security
U.S. Senate Committee on Appropriations

The Honorable Bennie G. Thompson
Chairman, U.S. House Committee on Homeland Security

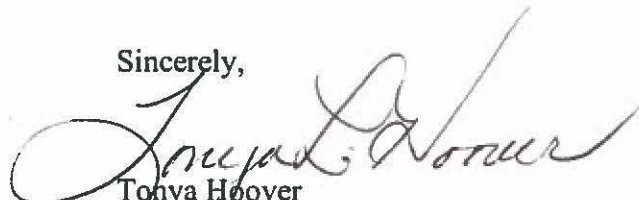
The Honorable John Katko
Ranking Member, U.S. House Committee on Homeland Security

The Honorable Gary C. Peters
Chairman, U.S. Senate Committee on Homeland Security and Governmental Affairs

The Honorable Rob Portman
Ranking Member, U.S. Senate Committee on Homeland Security and Governmental Affairs

For questions regarding this report, please contact the FEMA Congressional Affairs Division
at 202-646-4500.

Sincerely,



Tonya Hoover
Acting Fire Administrator
U.S. Fire Administration

Executive Summary

Background

In 1971, our nation lost more than 9,000 civilians and 250 firefighters to fire. Consequently, to help decrease tragic losses and to promote professional development of the fire and emergency response community, Congress passed the Federal Fire Prevention and Control Act of 1974 (Public Law No. 93-498), which, among other things, established the United States Fire Administration (USFA). Thanks to the cooperation between the nation's fire service organizations and the USFA, the United States' fire losses have since been reduced significantly. There has been a reduction of more than 60 percent in the fatalities among civilians and firefighters. The USFA recognizes the serious threat fires pose to the nation and is committed to working with its partners to safeguard the U.S. and its citizens.

From its beginning, the USFA focused on supplementing, not duplicating, existing programs of training, technology and research, data collections and analysis, and public education. Over the years, the USFA has adjusted to new developments and challenges facing the fire and emergency services community (e.g. the expanded need for Emergency Medical Services [EMS] and Wildland Urban Interface [WUI] impacts), always with the intention of providing leadership and support to stakeholders in our shared responsibility for public safety. Recognizing the evolving roles and expanding responsibilities of U.S. fire services, the National Fire Incident Reporting System (NFIRS) collects information on the full range of fire department responses. The NFIRS is an all-hazard database, considering firefighters are all-hazard responders. Participation in the NFIRS is voluntary, and more than 24,000 fire departments report to the NFIRS. Of approximately 28.5 million incidents reported to the NFIRS annually, approximately 1.2 million are fires. The largest percentage of incidents reported are related to EMS. In addition, fire departments respond to an endless variety of calls for assistance, including hazardous material spills, motor vehicle accidents, floods and water rescues, and explosions or bomb disposals. When there is a natural or man-made disaster, firefighters respond.

In fiscal year (FY) 2019, the USFA continued its role in providing national leadership for fire and emergency services stakeholders in mitigation, prevention, preparedness, and response. As an integral part of the U.S. Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA), the USFA embraces a whole community concept for emergency management and recognizes it takes all elements of a community to effectively prepare for, protect against, respond to, recover from, and mitigate all hazards and emergencies.

The U.S. Fire Administration Strategic Plan

The USFA developed a five-year Strategic Plan for FY 2019 to 2023¹, providing strategic and operational direction. The effectiveness of U.S. fire and emergency services relies on the USFA's efforts to lead on issues important to the nation. The USFA partners with fire and emergency services' organizations and stakeholders at the state, local, tribal and territorial (SLTT) level to achieve the desired outcomes outlined in the strategic plan. The following performance goals provide the foundation for the USFA's strategic planning and desired future for a fire-safe country:

¹ http://www.usfa.fema.gov/downloads/pdf/publications/strategic_plan_2019-2023.pdf.

- Build a culture of preparedness in the fire and emergency medical services.
- Ready the nation's fire and emergency medical services for all hazards.
- Ensure the USFA is an innovative, knowledgeable and responsive organization.

The USFA supports the above goals in partnership with the fire and emergency services' community, strives for continuous improvements, and seeks positive results in our programs and initiatives. The USFA measures its performance through long-term evaluation of its courses which includes feedback from supervisors who report that NFA's training improved their subordinate's job performance. In FY 2019, USFA's performance was 89.4 percent, which exceeds the 5-year target rate of 87 percent. In addition, USFA performance is measured by the data analysis conducted on the loss of life per million people due to fire in the United States. The 5-year target goal is to reduce the per capita loss of life to fewer than 10.9 fatalities per million population. USFA did not meet this measure in FY 2019, with an annual rate of 11.2 fire related civilian fatalities per million population. This metric was used in the strategic planning to identify opportunities for enhancements in the USFA's training, public education and fire prevention programs designed to address the nation's fire problem. This collaborative process will continue yielding benefits to the nation.

Current State of Fire Problems

Analysis of various fire trends during the past decades reveals remarkable progress in many aspects of the fire-related threats in the U.S. However, there remain several areas where additional efforts can reduce fire-related impacts.

For example, while structural fire-loss in absolute and per capita terms has declined significantly (by nearly half since the late 1970s), per-fire performance continues to be a concern. Despite significant progress in detection and prevention, fires requiring fire department response continue to yield similar or higher rates of civilian casualties than a decade ago. As indicated by collected data, fires in WUI locations continue to be a problem. According to the U.S. Forest Service, "Over the past two decades, fires have increased in severity, intensity, and cost as fire seasons have lasted more than 70 days longer, drought and increased temperatures contribute to dangerous conditions, and as more people have moved into fire-prone areas."²

Federal agency wildland data shows a drastic increase in lives lost, acres burned, dollar losses, and a negative impact to the landscape over a 10-year period. Homes built in or near WUI areas are increasing life and property risks as well as firefighting costs. During the past few years, WUI fires have destroyed entire communities; commercial, industrial and residential structures; and essential critical infrastructure in California, Colorado, Idaho, Montana, Oregon, Utah, Washington, and other states and tribal lands that experience an expanding WUI risk. This trend could be mitigated by SLTT jurisdictions adopting the most current model building codes and requiring homeowner management of the immediate, physical environment and surrounding vegetation. These practices are known as Firewise mitigation concepts. Furthermore, the trend could be mitigated by advocating for public policy that clearly communicates the inherent risk of building in WUI areas, and the public cost of financing emergency response and fire suppression.

² http://www.fs.fed.us/sites/default/files/legacy_files/media/types/testimony/Oct-8-Testimony-HAgC-Fire-Forest-Management.pdf.

The FEMA Administrator in his Calendar Year 2020 (CY20) Annual Planning Guidance calls for “Supporting wildland-urban interface fires” as these fires pose a rapidly growing threat to lives and property. The guidance directs the USFA to increase the Nation’s ability to understand, respond to, and mitigate WUI fires through improved data collection and analysis, prevention outreach, and by targeted training on WUI fires to our SLTT partners.

Residential fires remain the cause of approximately 80 percent of fire deaths each year. While this number of residential fire deaths has reduced substantially since the creation of the USFA in 1974, the majority of these losses stem from the lack of the oldest and most reliable defensive technology: automatic fire sprinklers. Automatic fire sprinklers are commonplace in businesses and institutions but have not reached widespread use in all residential occupancies.

Adoption of the most current model codes by local jurisdictions would lead to expanded use and more lives saved. Recent legislation granting tax relief for commercial business sprinkler installation will hopefully increase use of this technology. The Tax Cuts and Jobs Act allows small businesses to fully deduct up to \$1 million for fire protection upgrades or expenses such as the retrofit of automatic sprinklers (Pub. L. 115-197 Section 179 as amended). The provision applies only to commercial structures and cannot be used for retrofitting sprinklers into residential structures. While it may help prevent another large fatality commercial fire such as the February 2003 fire at The Station Nightclub in Rhode Island, it does not address the residential fire problem where some 80 percent of fire deaths occur.

To further reduce the threat of fire in the U.S., the USFA is revisiting the Congressionally commissioned ‘America Burning’ report to study the progress and identify hurdles since the creation of this evolutionary doctrine. The USFA is committed to continuing its efforts working with federal, SLTT partners, as well as nongovernmental stakeholders, in collecting and analyzing data, administering National Fire Programs, and operating the National Fire Academy.



Table of Contents

| | |
|---|----|
| Message from the U.S. Fire Administrator..... | 1 |
| Executive Summary..... | 3 |
| Table of Contents..... | 6 |
| I. Legislative Requirement..... | 7 |
| II. Background..... | 8 |
| III. The National Fire Problem (15 U.S.C. § 2215(a))..... | 9 |
| IV. Summary of Initiatives/Activities (15 U.S.C. § 2215)..... | 13 |
| Section 4.1 — Research and Technology (15 U.S.C. § 2215(b))..... | 13 |
| Section 4.2 — The National Fire Academy (15 U.S.C § 2215(c))..... | 16 |
| Section 4.3 — Activities to Assist the Nation’s Fire Services (15 U.S.C. § 2215(d)) | 26 |
| Section 4.4 — Public Education (15 U.S.C. § 2215(e))..... | 30 |
| Section 4.5 — Fire Safety Effectiveness Statements (15 U.S.C. § 2215(f)) | 35 |
| Section 4.6 — Outstanding Problems (15 U.S.C. § 2215(g))..... | 36 |
| Section 4.7 — Recommendations for Additional Legislation (15 U.S.C. § 2215(h))..... | 38 |
| Section 4.8 — Suggested Improvements to Fire Prevention and Building Codes (15 U.S.C. § 2215(i)) | 39 |
| V. Triennial Report FY 2017-2019 (15 U.S.C. § 2206(n)) | 40 |
| Section 5.1 — Introduction and Legislative Requirement..... | 41 |
| Section 5.2 — National Need and NFA Delivery System Changes | 42 |
| Section 5.3 — Changes to NFA Courses by Curriculum Area..... | 46 |
| Section 5.4 — Samples: Incident Lessons Learned Added to the NFA Curriculum..... | 56 |
| VI. Acronyms..... | 59 |

I. Legislative Requirement

This document responds to the reporting requirements set forth in the *Federal Fire Prevention and Control Act of 1974* (Pub. L. No. 93-498), as amended, codified at 15 U.S.C. § 2215, which states:

The Administrator of FEMA shall report to the Congress and the President not later than ninety calendar days following the year ending September 30, 1980 and similarly each year thereafter on all activities relating to fire prevention and control and all measures taken to implement and carry out this chapter during the preceding calendar year. 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;
- (b) a survey and summary, in such detail as is deemed advisable, of the research and technology program undertaken or sponsored pursuant to this chapter;
- (c) a summary of the activities of the [National Fire] Academy for the preceding 12 months, including, but not limited to—
 - (1) an explanation of the curriculum of study;
 - (2) a description of the standards of admission and performance;
 - (3) the criteria for the awarding of degrees and certificates; and
 - (4) a statistical compilation of the number of students attending the Academy and receiving degrees or certificates;
- (d) a summary of the activities undertaken to assist the Nation's fire services;
- (e) a summary of the public education programs undertaken;
- (f) an analysis of the extent of participation in preparing and submitting Fire Safety Effectiveness Statements;
- (g) a summary of outstanding problems confronting the administration of this chapter, in order of priority;
- (h) such recommendations for additional legislation as are deemed necessary or appropriate; and
- (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.

II. Background

On May 4, 1973, the National Commission on Fire Prevention and Control issued a report, “America Burning,” that focused attention on the nation’s fire problem and the needs of the fire services and allied professions. Much of the subsequent fire-prevention and response-enabling legislation was developed to address issues raised in “America Burning.” Consequently, to help decrease tragic losses and to promote professional development of the fire and emergency response community, Congress passed the *Federal Fire Prevention and Control Act of 1974* (Pub. L. No. 93-498), which, among other things, established the United States Fire Administration (USFA).

Section 5 of the United States Fire Administration, AFG, and SAFER Program Reauthorization Act of 2017, Pub. L. 115–98 provides that the Federal Emergency Management Agency (FEMA) Administrator “may develop and make widely available an electronic, online training course for members of the fire and emergency response community on matters relating to the administration of grants.” Section 6 of that Act further provides that the FEMA Administrator “shall develop and implement a grant monitoring and oversight framework to mitigate and minimize risks of fraud, waste, abuse, and mismanagement relating to such grants programs” under sections 33 and 34 of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2229 and 2229a).” Both provisions require the FEMA Administrator to undertake the two provisions by acting through the USFA Administrator. USFA provides the subject matter expertise and necessary assistance for the FEMA Administrator’s successful fulfillment of the two provisions.

Under authorities of the FEMA Administrator, the USFA operates in support of 2018-2022 FEMA strategic goals³ by: including all-hazard community risk reduction in National Fire Academy (NFA) curriculum; staffing select positions in the National Response Coordination Center; serving the Emergency Services Sector through the operation of the Emergency Management and Response Information Sharing and Analysis Center; advocating “whole community” in all programs; and actively participating in Joint Counterterrorism Assessment Team events at the National Counterterrorism Center to ensure fire-service representation and collaboration with law enforcement.

³ <https://www.fema.gov/strategic-plan>

III. The National Fire Problem (15 U.S.C. § 2215(a))

During the past four decades, the USFA has contributed to remarkable progress in reducing the adverse effects of fire on the U.S. Most notably, civilian fire-related fatalities and total fires are less than half of what they were in the late 1970s.⁴ Through partnerships with SLTT governments, and private organizations, children up to 4 years of age are no longer a statistically high-risk group.

Despite this progress in the reduction of fires in the U.S., there is still a need to continue the work of lessening the fire problem. Although there is an overall reduction in the number of fires and casualties in absolute number, the U.S. still has similar rates of civilian casualties per reported fire. Certain demographic groups remain at high risk, potentially driven by socioeconomic and physical conditions. For example, older adults (age 65 and older) experience age-related physical and mental disabilities which may make it more difficult for them to survive during a fire. This vulnerable population is increasing, which increases the percentage of the population who are at high risk during a fire.⁴

This section provides a statistical portrait of the fire problem in the U.S., meeting the legislative requirement to provide a thorough appraisal, including statistical analysis and estimates of the human and economic losses due to fire. The primary sources of data are the National Fire Incident Reporting System (NFIRS), a voluntary system that has had tremendous success as shown by the more than 24,000 fire departments who participate in submitting data; and the National Fire Protection Association's (NFPA's) Annual Survey of Fire Department Experience. The report lags behind the data collection date due to the challenges of receiving timely input from states, tribes, and territories. Data are collected on a calendar year basis, and they must be released by the states and tribes prior to analysis. Therefore, some of the data elements collected in the NFIRS are not yet available for 2019, which explains why the most current statistical information contained in this report represents CY 2018. Some comparisons are made from 1977, which is the first year the most reliable data was available. The NFIRS individual state profiles for fire loss are available at <https://www.usfa.fema.gov/data/statistics/states/>.

The following are summaries of the nation's fire problem:⁵

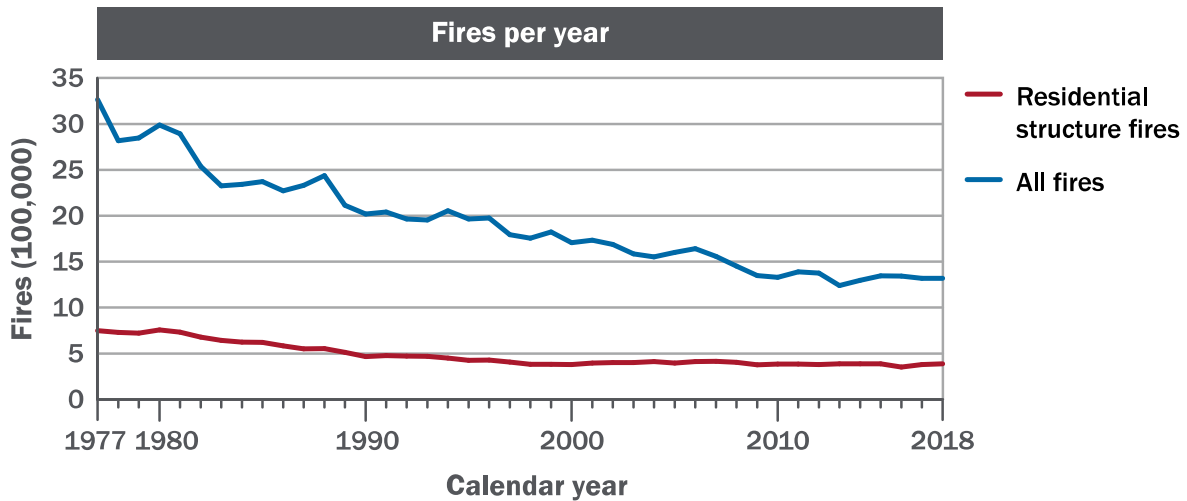
Total fires: The estimate for total fires during 2018 is 1,318,500 — a 59.6 percent reduction from the number of fires in 1977 (3,264,000). During the past 10 years (2009 to 2018), the U.S. has averaged 1.3 million fires per year. In 1977, there were 14,820 fires per million population. In 2018, there were 4,030 fires per million population (a slight decrease over 2017 of one half of one percent – 4,051 fires per million). From 1977 to 2018, there was a 72.8 percent reduction in the number of fires per million population.

Residential structure fires: The estimate for residential structure fires during 2018 is 387,000 — a 48.4 percent reduction in residential fires from 1977 (750,000). During the past 10 years (2008 to 2018), the U.S. has averaged 380,750 residential structure fires per year. In 1977, there were 3,405 residential structure fires per million population. In 2018, there were 1,186

⁴ Data sources: USFA's National Fire Incident Reporting System (NFIRS); National Fire Protection Association's (NFPA's) annual Fire Experience survey; U.S. Census Bureau; National Interagency Fire Center (NIFC); and various National Fire Data Center staff analyses and reports.

⁵ Sources for statistics gathered in this section were taken from references noted in footnote 3.

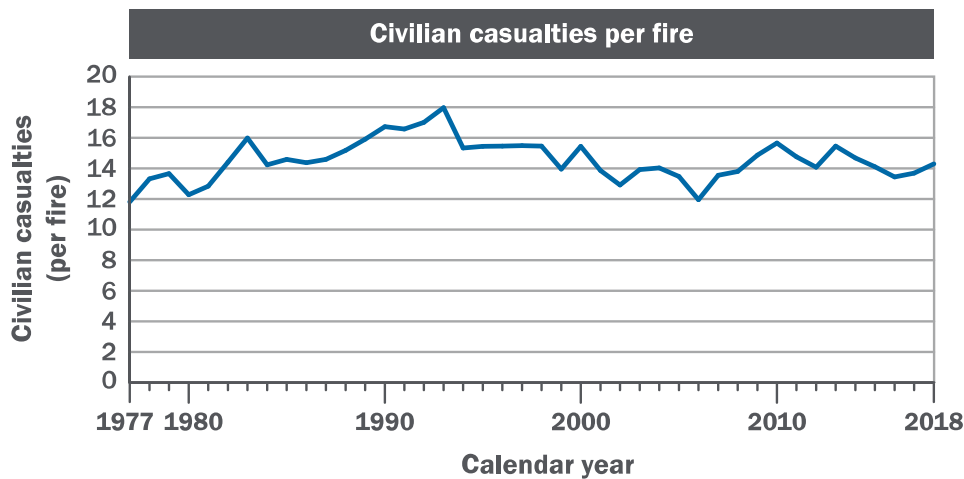
residential structure fires per million population (an increase over 2017 of 1.89 percent – 1,164 fire per million). From 1977 to 2018, there was a 65.2 percent reduction in the number of residential structure fires per million population.



Civilian fire fatalities: The estimate for total civilian fire fatalities during 2018 is 3,655 — a 50.6 percent reduction in fatalities since 1977 (7,395). During the past 10 years (2009 to 2018), the U.S. has averaged 3,223 civilian fire fatalities per year. In 1977, there were 33.6 civilian fire fatalities per million population. In 2018, there were 11.2 civilian fire fatalities per million population. From 1977 to 2018, there was a 66.7 percent reduction in the number of civilian fire fatalities per million population.

Civilian fire injuries: The estimate for total civilian fire injuries during 2018 is 15,200 — a 51.3 percent reduction in injuries since 1977 (31,190). During the past 10 years (2009 to 2018), the average was 16,220 civilian fire injuries per year. In 1977, there were 141.6 civilian fire injuries per million population. In 2018, there were 46.5 civilian fire injuries per million population. From 1977 to 2018, there was a 67.2 percent reduction in the number of civilian fire injuries per million population.

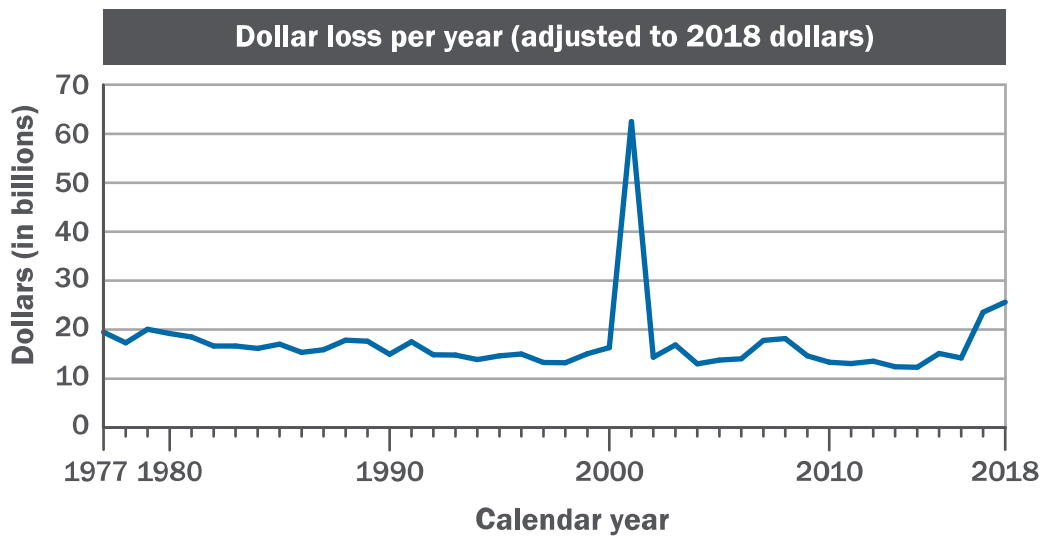
Civilian casualties (fatalities and injuries) per 1,000 fires: The estimate for civilian casualties (fatalities and injuries) per 1,000 fires in 2018 was 14.3, an increase of 21.0 percent since 1977 (11.8). During the past 10 years (2009 to 2018), the average was 14.5 civilian casualties per 1,000 fires.



Firefighter fatalities: Eighty-two firefighters died while on duty in 2018 — a 14.6 percent decrease from 2009 (96). During the past ten years (2009 to 2018), the U.S. has averaged 91.5 on-duty firefighter deaths per year. Occupational-related cancer deaths continue to be a concern in the fire service.

The USFA released the “Firefighter Fatalities in the United States” study in 2019 detailing on-duty firefighter deaths⁶.

Property damage – dollar loss: The estimate for total dollar loss during 2018 was \$25.6 billion, an increase of 31.4 percent from 1977 (\$19 billion, adjusted to 2018 dollars).⁷ Over the past 10 years (to 2018), the average was \$14.8 billion per year (in 2018 dollars).



⁶ https://www.usfa.fema.gov/data/statistics/ff_fatality_reports.html.

⁷ The 2018 estimate of total dollar loss includes over \$12 billion loss in wildland fires.

Wildland fires: There were 58,083 wildland fires reported during 2018. This resulted in 8,767,492 acres burned — a 12.6 percent decrease from 2017 (10,026,086 acres burned.) During the past 10 years (2009 to 2018), the average was 66,903 wildland fires and 6,972,600 acres burned.⁸

Emergency Medical Services: The growth of fire service-based EMS has had a significant impact on local fire departments requiring additional resources to address the increased scope of responsibilities. According to the latest data, 70.2 percent of the nation’s fire departments provide EMS.⁹

Fire risk to children: With the general population indexed at 1.0, the relative risk for child fire deaths (0 to 4 years of age) in 1983 was 2.0, twice the general population. In 2017, the relative risk for child fire deaths (0 to 4 years of age) was 0.6. Although the fire death risk for children in this age group has declined, when compared to children in older age groups (i.e., ages 5 to 9 and ages 10 to 14), children ages 4 and under are still at greater risk of dying from fire.¹⁰

Fire risk to older adults: With the general population indexed at 1.0, the relative risk for adults ages 65 and older who died in fires in 1983 was 2.5. In 2017, that relative risk was also 2.5.¹¹

Overall summary: While structural fire loss has significantly declined (by nearly half since the late 1970s), per-fire performance continues to be a concern. Despite progress in detection and prevention, fires requiring fire department response continue to yield similar or higher rates of civilian injuries and deaths to the rates from more than a decade earlier. As indicated by collected data, fires in WUI locations continue to be a problem. According to the U.S. Forest Service, “Over the past two decades, fires have increased in severity, intensity, and cost as fire seasons have lasted more than 70 days longer, drought and increased temperatures contribute to dangerous conditions, and as more people have moved into fire-prone areas.”¹²

The USFA serves as a valuable catalyst for great progress in overcoming the fire problem across the nation; however, we recognize the need to increase efforts to further reduce the adverse impacts of fire in the U.S. (e.g., increased fire activity in the WUI). The FEMA Administrator in his CY20 Annual Planning Guidance calls for “Supporting wildland-urban interface fires” as these fires pose a rapidly growing threat to lives and property. The guidance directs the USFA to increase the Nation’s ability to understand, respond to, and mitigate WUI fires through improved data collection and analysis, prevention outreach, and by targeted training on WUI fires to our SLTT partners.

To further reduce the threat of fire in the U.S., the USFA is committed to continuing its efforts in working with federal, SLTT partners, as well as nongovernmental stakeholders, in collecting and analyzing incident data, administering National Fire Programs, and operating the NFA.

⁸ https://www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html.

⁹ USFA National Fire Department Registry, as of October 1, 2019.

¹⁰ 2017 Centers for Disease Control and Prevention/National Center for Health Statistics Mortality data file.

¹¹ Ibid.

¹² http://www.fs.fed.us/sites/default/files/legacy_files/media/types/testimony/Oct-8-Testimony-HAgC-Fire-Forest-Management.pdf.

IV. Summary of Initiatives/Activities (15 U.S.C. § 2215)

Section 4.1 — Research and Technology

(15 U.S.C. § 2215(b))

The USFA provides federal fire focus for applied research and technology. Studies and research are accomplished in partnership with a wide range of organizations that share the USFA’s mission in reducing the nation’s fire loss. The following activities are brief summaries of the USFA’s significant initiatives in research and technology for FY 2019. Additional details are available online at <https://www.usfa.fema.gov/>.

“America Burning” review: The USFA through a partnership with the International Association of Fire Chiefs (IAFC) has initiated a study based on past USFA “America Burning” reports and including current sources of data and information to examine and address the American fire problem. The study includes fire deaths, injuries, and property loss of the public as well as occupational health and safety of the fire and EMS service, and how the USFA with its partners can find solutions. Since the last “America Burning” report in 2002, there have been many changes in the fire problem of the U.S. as well as its fire and emergency services.

Wildland Urban Interface fire operational requirements and capability analysis: The FEMA Administrator requested the DHS Science and Technology Directorate (S&T) research new and emerging technology that could be applied to wildland fire incident response, given the loss of life that occurred in California during the fall of 2017 in Santa Rosa and Ventura. In response to the request, DHS S&T — in collaboration with FEMA, the USFA, and other key stakeholder experts — determined WUI incidents and life-saving functions as the optimal areas for DHS S&T to explore technology innovation. The findings of this effort were released in the May 2019 report “Wildland Urban Interface (WUI) Fire Operational Requirements and Capability Analysis: Report of Findings¹³.”

New smoke alarm technology: FY 2019 marked a major milestone in the technology available to consumers to improve home fire safety. Following years of intense research and development on the part of USFA and our partners at the Consumer Product Safety Commission (CPSC), the National Institute of Standards and Technology (NIST), Oak Ridge National Laboratories, UL, and many others, home smoke alarms using advanced new technology became available for consumer purchase and began to appear on store shelves. The technology in these new smoke alarms should significantly reduce nuisance alarms from cooking and other sources and should ensure earlier alerting to fires involving modern synthetic materials such as polyurethane foam.

National Fire Incident Reporting System outreach and marketing initiative: USFA partners with the IAFC to study and develop effective NFIRS outreach and marketing to include the content of tools and materials that can be used by USFA or other organizations. This project will also enhance the support and advocacy for NFIRS within the fire service to enhance its use and data accuracy.

¹³ <https://www.dhs.gov/publication/st-wui-fire-operational-requirements-and-capability-analysis-report-findings>.

Emerging health and safety issues among women in the fire service: The USFA in partnership with the Women in Fire organization released a March 2019 report — “Emerging Health and Safety Issues Among Women in the Fire Service”¹⁴ — which provides findings of the study. This report developed resources and recommendations that address long-term and emerging health and safety issues faced by female firefighters.

Study of volunteer firefighter retention and recruitment: The USFA is partnering with the National Volunteer Fire Council (NVFC) on a study of volunteer firefighter retention and recruitment. There has been an overall decline in the number of volunteer emergency responders nationwide. This project will concentrate on the essential roles and responsibilities of local-level governments in this effort. Additionally, it will focus on development of effective recruitment and retention of underrepresented populations in the volunteer service including women and minorities.

Funding alternatives for fire and emergency medical services: The USFA initiated a study with the Oklahoma State University/International Fire Service Training Association to update the USFA report “Funding Alternatives for Fire and Emergency Medical Services.”¹⁵ With tighter agency budgets, less government subsidies, fewer donations, etc., it is becoming increasingly harder for fire and emergency medical services departments to meet greater and more complex demands for their services. This has been one of the USFA's most popular reports.

Study of emergency vehicle warning lighting systems: The USFA initiated a new project with the Cumberland Valley Volunteer Firemen’s Association’s (CVVFA) Emergency Responder Safety Institute to study emergency vehicle warning lighting systems with a goal to effectively mitigate the disorientation of motorists caused by emergency warning lighting.

Emergency medical services responder safety study: With the International Association of Fire Fighters (IAFF), USFA initiated a study on the occupational safety of EMS responders. This partnership will update older USFA reports on this topic.

Cancer among firefighters: The USFA is continuing its long-term partnership with the National Institute of Safety and Health on an epidemiological study of occupational cancer and firefighting as part of their National Occupational Research Agenda Program. This work will aim to increase the precision of disease risk estimates.

Roadway safety: The USFA, with U.S. Department of Justice funding, supported a workshop of the CVVFA Emergency Responder Safety Institute which released their findings in the March 2019 report — “Hardening Blocking Vehicles for Traffic Incidents and Planned Special Events.”¹⁶

Flashover prevention system study: The USFA is working in partnership with the Underwriters Laboratories (UL) on the second phase of a flashover prevention system study to continue the development of a residential fire control system that can be retrofitted into existing homes, ideally by a homeowner having moderate handyman skills.

¹⁴ https://www.usfa.fema.gov/downloads/pdf/publications/emerging_health_safety_issues_women_fire_service.pdf.

¹⁵ https://www.usfa.fema.gov/downloads/pdf/publications/fa_331.pdf.

¹⁶ <https://d35c9cxl8mg8m.cloudfront.net/Downloads/7c2cc4cd-16fe-4894-bea5-951bc5ee9982/1/ERSIWhitePaperBlockingVehicles.pdf>.

National Fire Department Registry: The number of fire departments registered with the USFA’s National Fire Department Registry decreased by 51 departments — from 27,258 in FY 2018 to 27,207 in FY 2019 (due to departments merging or closing). The registered departments represent 91 percent of the NFPA-estimated 29,819 departments in the U.S. in 2017.

Topical reports: The USFA published seven topical reports in FY 2019; “Fire Risk in 2016,” “Residential Building Electrical Fires (2014-2016),” “Winter Residential Building Fires (2014-2016),” “Residential Building Cooking Fires (2014-2016),” “Fire Department Overall Run Profile as Reported to the National Fire Incident Reporting System in 2017,” “Fire-Related Firefighter Injuries Reported to the National Fire Incident Reporting System (2015-2017),” and “Fire Risk in 2017.” These reports, part of the USFA’s Topical Fire Report Series,¹⁷ are designed to explore facets of the U.S. fire problem as depicted through data collected in the USFA’s NFIRS. Each report briefly addresses the nature of the specific fire or fire-related topic, highlights important findings from the data, and may suggest other resources to consider for further information.

Also published in FY 2019 were specialty reports, “Thanksgiving Day Fires in Residential Buildings (2014-2016) – Data Snapshot”¹⁸ that looks at the impact of the Thanksgiving Day holiday on the fire service compared to the rest of the year and “Medical Facility Fires (2014-2016) – Data Snapshot”¹⁹ that looks at the impact of medical facility fires in the U.S. In addition to these reports, the USFA published the “USFA Fire Estimate Summary Series (2008-2017).”²⁰ Each summary addresses the size of the specific fire or fire-related issue and highlights important trends in the data.

Fires are not the primary emergency that fire departments respond to. The “Fire Department Overall Run Profile as Reported to the National Fire Incident Reporting System 2017”²¹ reports that, in 2017, fire departments responded to 26,880,800 incident calls that were reported to the NFIRS. Of these calls, almost two-thirds (64 percent) required EMS and rescue services and only 4 percent were fires. The remaining 32 percent included good intent, false alarm, service, hazardous condition (no fire) and other special incident type calls.

¹⁷ <https://www.usfa.fema.gov/data/statistics/reports/>.

¹⁸ https://www.usfa.fema.gov/data/statistics/reports/snapshot_thanksgiving.html.

¹⁹ https://www.usfa.fema.gov/data/statistics/reports/snapshot_medical_facility.html.

²⁰ https://www.usfa.fema.gov/downloads/pdf/statistics/res_bldg_fire_estimates.pdf.

²¹ <https://www.usfa.fema.gov/data/statistics/reports/>.

Section 4.2 — The National Fire Academy

(15 U.S.C. § 2215(c))

The NFA delivers classes and programs that are not readily available throughout the nation for reasons of economy, scale, or demand. Students are selected for participation in NFA classes based on their current job responsibilities and the completion of prerequisite training (which varies from course to course). The NFA courses are externally reviewed, validated, and recommended for college credit by the American Council on Education, as the NFA is not a degree granting institution. Certificates of completion are issued to students who meet the requirements of the respective course.

The NFA worked on closing out the FY 2018 state fire-training assistance grant program for the 47 states that participated in the FY 2018 program.

In FY 2019, the NFA provided 3,034 course offerings, reaching 96,369 students, and providing 198,445 student days of instruction. This was accomplished through the strong and far-reaching delivery system of NFA-sponsored courses held on campus at the National Emergency Training Center (NETC), off-campus courses held at state and local sites, state and local partner-sponsored courses, technology-based (instructor-led and self-study) courses, and higher education courses delivered in cooperation with 116 colleges and universities.

One of the NFA's most popular learning venues, "Coffee Break Bulletin,"²² delivers short, one-topic training messages directly to students through the Listserv technology. The NFA delivered 127,710 noncredit subscription learning opportunities via this initiative.

Included in the NFA overall delivery system are the NFA-approved State Courses. This cooperative effort adds state-developed courses to the NFA curriculum, thereby reducing some development costs. This adds curriculum content that is otherwise unavailable to other state and local training partners. The NFA delivered 550 of these courses to 8,527 students, resulting in 42,796 student days of instruction.

The FY 2019 NFA training data for all modes of delivery by individual states is available at <https://www.usfa.fema.gov/training/nfa/about/profiles>.

Executive Fire Officer Program: The Executive Fire Officer (EFO) Program is currently a four-year executive education program for senior fire executives and other mid-level managers. At any given time, there are more than 600 students in one of the four phases of the EFO Program.

In FY 2019, the EFO Program had 274 graduates. During the 31 years the EFO Program has been in existence, 4,345 executives have graduated from the program, both American and international students.

The EFO Program continues its program revision and transitioning into a two-year cohort, blended learning format that combines mediated online learning with traditional on campus

²² https://www.usfa.fema.gov/training/coffee_break.

resident learning. The first participants in the revised EFO Program will begin in December 2019.

Each year, the NFA holds an EFO Program symposium. This two-day symposium provides cutting-edge topics for fire and emergency services leaders. Over two hundred leaders attended this year's symposium. The NFA recognized Outstanding Research Award recipients who represented each EFO class within the program, and recipients of the EFO Honor Roll for achieving a 4.0 grade point average in each of their applied research papers.

Managing Officer Program: The Managing Officer (MO) Program is a two-year program for first-level or mid-level officers/supervisors. The purpose of the program is to engage emergency service leaders in professional development earlier in their careers and to instill within the student the whole community risk-reduction model. The MO Program currently includes 600 students in their first or second year. To date, 350 students have successfully completed all program requirements and have received their MO certificates.

College- and University-based course deliveries/Fire and Emergency Services Higher Education: The Fire and Emergency Services Higher Education (FESHE) Program is an acknowledgment that a collegiate emergency services degree program meets the minimum standards of excellence established by FESHE professional development committees and the NFA.

These regionally or nationally accredited colleges and universities deliver a standard curriculum using standard syllabi and course titles, easing credit transfer when students change schools. It is a competency-based curriculum that standardizes what a "fire degree" means to the student and employer. As a result of the FESHE Program, all fire textbook publishers produce texts that comport with the syllabi and curriculum. The standard degree program concentrates on fire engineering, prevention and mitigation, emergency response, fire administration, and EMS management. Currently there are 116 colleges/universities (nine more than last year) from 34 states recognized through this program. In FY 2019, the NFA provided 630 course offerings to 4,841 students through FESHE.

Training evaluation: The NFA continually evaluates the outcome of its training using the Kirkpatrick Training Evaluation Model. This model helps the NFA to measure the effectiveness of training in an objective way. Through the NFA evaluation process, three of the four levels are measured (reaction, learning, and behavior) from student and supervisor evaluations. This is a systematic study of resident courses soliciting anonymous feedback from students and their supervisors to determine long-term training effectiveness. During FY 2019, 487 students and 399 supervisors responded. As with responses from previous years, students indicated that they were able to transfer the training and learning skills to their jobs, and supervisors reported improved performance as follows:

| Long-term evaluation reporting elements | 2018 | 2019 |
|--|-------------|-------------|
| Students reporting that they were able to apply NFA training at home | 91.0% | 94.3% |
| Students reporting that NFA training improved their job performance | 97.1% | 96.3% |
| Students reporting that they shared NFA training with their peers | 97.0% | 95.1% |
| Students reporting that they conducted formal courses with NFA material | 24.8% | 23.6% |
| Students reporting that they established new policies and procedures based on NFA training | 77.1% | 72.5% |
| Supervisors reporting improved performance from NFA training | 90.9% | 89.4% |
| Supervisors reporting improved departmental performance | 88.4% | 86.9% |
| Supervisors who say that they will recommend NFA training to others | 97.4% | 96.4% |
| Supervisors reporting that NFA benefits outweigh costs | 94.7% | 92.4% |

Note: Reported data were derived from NFA Long-Term Evaluation forms sent to both students and their supervisors four to six months after the NFA training class ended.

NFA Online: The NFA Online self-study training catalog currently includes 37 web-based courses. This includes 10 courses offered in conjunction with the National Wildland Coordinating Group. In FY 2019, the NFA released two new self-study courses and pilot tested two other courses that will be released early next year. Two new self-study courses in the Community Risk Reduction curriculum area were developed and will be pilot tested early next year. In FY 2019 there were 50,759 course completions.

In FY 2019, the NFA expanded its online mediated program significantly to include selecting this delivery method as part of the EFO Program. In addition, NFA continues its conversion of resident courses to an online mediated format. This expansion continues to be a priority of stakeholders and students. The NFA online mediated platform experienced exponential growth in 2019 and is the fastest growing delivery method at NFA. This trend is expected to continue into the foreseeable future.

Also in FY 2019, the NFA continued to explore various options of using online blended learning. Blended courses are those classes where a portion (25 to 70 percent) of the traditional face-to-face instruction or activities are replaced and/or supplemented by web-based, online learning. These activities include participating in group blogs or individual discussion threads, multimedia assignments and/or completing individual activities.

American Council on Education: The FY 2019 annual review included 41 courses. The results indicate all courses will receive college credit recommendations transferrable to local degree programs.

Continuing Education Units: The Continuing Education Units (CEUs) are awarded through the International Association of Continuing Education and Training for all 10-, six-, and two-day on- and off-campus courses, and online courses.

International Code Council: The NFA is an approved Preferred Provider with the International Code Council (ICC). This program recognizes and promotes ICC-approved educational opportunities as they relate to codes, standards, building construction, and other subject-related areas. Nine NFA courses have been approved for CEUs through the ICC and are listed in their catalog at <https://ppp.iccsafe.org>.

Significant curriculum enhancements

The NFA continues to use recommendations from national level sources and subject matter experts to make sure its curriculum is both current and relevant to today and future needs. Needs assessments were finalized in six curriculum areas during FY 2019. The results with recommendations were briefed to the NFA Curriculum Management Committee (CMC). The CMC approved the recommendations with nine course developments funded for FY 2020 and an additional seven course developments being funded for FY 2021.

Emergency Medical Services curriculum: In FY 2019, the NFA continued review and revision of its EMS curriculum and program pursuant to Congressional directives. The data reported in the USFA Topical Fire Report “Fire Department Overall Run Profile (2017)” reflected that 64 percent of reported calls to fire departments required emergency medical services and rescue services. This program’s goal is to promulgate more effective EMS program management by the nation’s emergency response community while not competing with state medical authorities and local training organizations that are very successful at delivering hands on emergency medical field skills. This work included the development and piloting of two new courses:

- “Management and Planning of Specialized Operations for Emergency Medical Services.” This resident course provides students with the knowledge, skills and abilities to develop comprehensive, risk-based specialized operations response plans and management systems for EMS. A practical application of incident command specific to EMS components, topics address the effective management of the EMS components of planned events and complex incidents.
- “Mobile Integrated Healthcare (MIH) Program Management.” This NFA Online mediated (instructor facilitated) course provides the knowledge and skills needed to develop an MIH program for each student’s community. Successful students will take away an MIH plan to propose to their agency’s leadership.

The NFA recognizes future challenges for EMS; these include pre-incident planning for EMS aspects of large-scale disasters, evolving partnerships among different EMS response disciplines, EMS management considerations as part of a national health care strategy, and the challenges of EMS service delivery in tight economic times through evidence-based change. These challenges will continue to be incorporated into curriculum during the on-going course updating.

Fire and Investigative Sciences curriculum: With an emphasis on the convergence of science, law, and investigative responsibility, courses and instructors ensure learners receive exceptional education and training. Conducted in cooperation with the Bureau of Alcohol, Tobacco, Firearms and Explosives, Underwriters Laboratories (UL), and professional associations, the NFA continues to lead the nation in the delivery of fire investigation, forensic and fire science, arson investigation, interviewing and courtroom testimony education and training.

The programs feature extensive student activities, hands-on participation, live burns, scene processing, mock testimony, and an instructor/mentor student interaction that is unparalleled and consistently results in highly positive feedback from the students. Operations are underway after

a major refurbishment of the NFA Burn Lab, including a 15- by 36-foot complex burn building and eight new burn rooms. This practical exercise area is used by students in the program and other stakeholders. A complete renovation and rebuild of the burn buildings is nearly complete, increasing capacity for student activities.

Our partnership with the DHS S&T continued and was strengthened in FY 2019, which resulted in combined use of the Burn Lab for cross-directorate training and testing.

Beginning in FY 2018 and continuing into FY 2019, the entire curriculum is under extensive revision. The final result expected in FY 2020 will be a fire investigation program updated with student activities and content unmatched by any other program in the country.

Fire Prevention — Management curriculum: This curriculum area offers a wide array of courses intended for individuals new to fire prevention/community risk reduction and up to the senior fire officers. The curriculum addresses how to manage fire-prevention programs for a new fire marshal or those responsible for a program area within a fire-prevention/risk reduction bureau, community risk reduction for mid-management, using public policy to address risk, and developing programs to prevent and intervene in youth fire-setting. These courses are offered on and off campus.

Acting on recommendations from the 2017 comprehensive curriculum review, the NFA developed new courses to supplement the Public Education and Fire Prevention Management curricula. “Introduction to Community Risk Reduction” and “Community Risk Assessment” are online self-study courses currently in the pilot offering stage. Both courses will become entry points for the NFA risk reduction curriculum, managing officer program and executive officer experience so students enter with a strong baseline knowledge of what constitutes strategic risk reduction.

Fire Prevention — Public Education curriculum: This curriculum area offers courses for a person newly assigned to fire and life safety education and/or community risk reduction, as well as those seeking ways to evaluate their programs. The third online course nearing completion is an online mediated offering entitled “Fundamentals of Fire and Life Safety Education.” This course will empower learners with the knowledge, skills, and abilities to deliver programs that facilitate measurable learning outcomes resulting in behavioral change. It will feature a section on how to strengthen partnerships with local schools, so fire and life safety education becomes a key component of an educational institution’s essential core curriculum and is evaluated accordingly. This course will pilot in Spring 2020.

Fire Prevention — Technical curriculum: The modern built environment is sophisticated and complex. New construction materials and techniques — coupled with demands for reduced costs and environmental sustainability — require knowledgeable building and fire codes officials engaged in construction code enforcement. The NFA’s Fire Prevention: Technical curriculum provides education, leadership, and vision for fire safety providers to reduce the risk of injury, loss of life and property in their communities through effective and comprehensive fire prevention and fire protection/risk management efforts.

Today's movement toward (and requirements associated with) the use of energy-efficient building components create challenges in the fire protection environment. For instance, many new buildings have glass that is hard for firefighters to break in an emergency. This glass, combined with other modern building materials, may make fire department radio digital antenna systems (DAS) communications difficult due to transmission issues from within the building to outside units and external radio towers. In addition, as older buildings are repurposed, or new construction initiated, there is a trend toward the use of building materials to be manufactured using recycled materials. Over the past 10 years, there has been a growing interest in tall buildings constructed from mass timber materials.²³ This practice brings into question the structural integrity of the material during a fire situation.²⁴

In many urban and suburban environments, aging populations downsize and move into smaller occupancies, which are sometimes located in mid- to high-rise facilities. While many individuals move to their new home while still fully mobile, the aging process, combined with potential health and mobility issues, ultimately impacts a person's ability to self-evacuate in the event of a fire. The original design of the building may not have been intended to house mobility-impaired individuals. When a fire incident occurs in this type of environment, evacuation is not a fast process, and the risk of injury for occupants and rescue personnel increases. Fire and building codes often do not take the age, health, and mobility of the residents into consideration.

The curriculum addresses all levels and complexities of building design, use and occupancy, and the many complex fire protection features and systems that are found in today's built environment. The goal of this program is to develop a national corps of fire and building code officials highly trained and prepared to make informed decisions about life safety and fire protection issues that directly impact community safety.

The training is heavily application-based; the techniques and evaluative skills taught within the courses directly reflect lessons learned. These lessons learned are incorporated into the development and implementation of the latest editions of building and fire codes and standards. The NFA Fire Prevention: Technical curriculum consists of five primary core educational elements:

- Building Construction for Fire Protection
- Fire Behavior and Combustion
- Fire Prevention and Mitigation
- Fire Protection and Life Safety Systems
- Community Risk Reduction

Hazardous Materials curriculum: In 2019, the USFA continued to support the interagency agreement with the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the Department of Transportation. This partnership provides for the continuation and final products development for online hazardous materials awareness and operations courses and, supports the

²³ [Tall Wood Buildings in the 2021 IBC](#) *Up to 18 Stories of Mass Timber* Scott Breneman, PhD, SE.

²⁴ WoodWorks – Wood Products Council Matt Timmers, SE, John A. Martin & Associates Dennis Richardson, PE, CBO, CASp American Wood Council.

Hazardous Materials Emergency Planning Grant Process as well as PHMSA Crude by Rail and Liquefied Natural Gas (LNG) by Rail products, including LNG Town Hall Meetings. The most current agreement provides for a collaboration with the IAFC to host the annual Roundtable Meetings. These meetings assist in identifying gaps, needs, and emerging issues related to planning, training, and response within the hazardous materials response community.

The USFA and the NFA continue to support and participate in the development of output products, as data becomes available, associated with the DHS S&T Jack Rabbit project — a field project in collaboration with DHS S&T Chemical Security Analysis Center, Department of Defense’s Defense Threat Reduction Agency, DOT PHMSA and others analyzing the large-scale, catastrophic release of toxic industrial chemicals in urban areas — and incorporating relevant information into our current curriculum. The USFA and NFA continue to evaluate the data from the trials to affect change in planning, response, and training associated with catastrophic bulk carrier releases of compressed liquefied gases in an urban environment. The lessons learned are currently being disseminated nationally and incorporated into training programs across the nation.

In 2019, two courses were revised, and a new course, “Advanced Science for Hazardous Materials Response” was piloted and finalized. There are an additional two courses in revision with a new course on the horizon for FY 2020 delivery. Educational developments continue to be focused on current, emergent, and relevant trends associated with hazardous materials/weapons of mass destruction response.

Incident Management curriculum The Incident Management curriculum is an important component of the NFA training program, and with over 20,000 completions, is one of the most successful and popular of the NFA curricula offered. One of the many reasons for the success of this curriculum is the currency of the materials and the applicability to the day-to-day duties of the students. In FY 2019, NFA incorporated new visions toward how we lead during incidents and addressing community lifelines in a whole community, integrated environment simulations to reflect the current best practices as related to complex incidents as well as the current relevant national standards.

Simulations were enhanced to reflect current trends from incidents nationwide. Increased technology use has provided a higher degree of image fidelity and better display. The NFA also introduced a virtual capability that allows us to engage audiences around the nation to discuss some of the nation’s critical yet infrequent incidents. This allows us to remain current yet control costs. The scenarios have also been enhanced to account for changes in building construction and student learning points, which allow for a better understanding of actual fire progression and the impacts of each action taken.

The NFA continued to update courses to reflect the refreshed National Incident Management System (NIMS) doctrine and Emergency Operations Center skillsets. NIMS provides a common nationwide approach to enable the whole community to work together to manage all threats and hazards. NIMS applies to all incidents, regardless of cause, size, location or complexity. These concepts and principles are integrated within all of the Incident Management curriculum to include lessons learned from incidents and whole community approaches and best practices.

Curriculum was updated to include techniques and strategies to increase effectiveness in incident and disaster operations to better position jurisdictions to respond to catastrophic incidents.

The incident management curriculum staff are major participants in the lessons learned project. These activities support our efforts to maintain current and relevant training and education by learning from real world incidents and the successes, best practices, and issues associated with those events. This program will allow continuous improvement of NFA's courses and advances the NFA's ability to enhance the delivery of programs, services, and support in a manner that can measurably improve outcomes for the fire and emergency services community.

Reports developed from staff deployments include research from publicly available documents, interviews with responders, reviews of similar recent incidents, and in-person analysis of the incident site and surrounding area that is impacted. As a result of this project, speakers were brought in to address classes both in person and virtually to speak about best practices, lessons learned, and unique problem sets faced during these incidents. Incidents represented were the Camp Fire as well as further integrating and expanding those relevant items from incidents to include but not limited to Ghost Ship Fire, Route 91 Harvest Music Festival shooting, Parkland Shooting, Great Smoky Mountain Gatlinburg Wildfires, hurricane Harvey, Pulse Nightclub shooting, Montecito Mudslides, Thomas Fire, and flooding in Ellicott City.

The Incident Management area expanded its partnership with NIST to capture educative 360-degree video from a wildfire and structure fire. The footage allows the learner to immerse themselves in the scene and see different aspects of the fire. NFA continued to bolster its partnership with DHS S&T with participation in the Enhanced Dynamic Geo-Social Environment, Predictive Modeling, Next Generation First Responder, and the DHS First Responder Group to include testing current technologies as well as integrating a school setting and other simulated environments to enhance learning. This partnership allows USFA/NFA to strengthen our stakeholders' abilities to respond to events in an all hazards environment. As the coordinating element for USFA/NFA, the Incident Management program area has utilized this partnership to maximize efficiencies crossing over to other curriculum areas that include Arson/Fire Investigation and Firefighter Safety.

Leadership and Executive Development curriculum: The delivery methodology for 32 courses in the Leadership and Executive Development curriculum are under revision, moving from an instructor-led lecture format to a facilitator-led Socratic method.

A new online course, "Applied Research Design for Fire and Emergency Medical Services," was released in August 2019. This course replaced three self-study research design courses into a single comprehensive research methodology course that directly supports the EFO Program. To date, 80 students have successfully completed the instruction.

In FY 2019 a curriculum development project, "Effective Communications for Fire and EMS Success" was piloted. This is the first truly blended course development whereby students will participate in both online mediated and in-classroom environments.

A new 6-day course "New Executive Chief Officer" was developed and piloted in FY 2019.

Planning and Information Management curriculum: Two new online mediated courses have completed the pilot process and are being offered for delivery using the NFA’s distance learning platform. “Decision Making and Financial Management” is a six-week online mediated course that introduces participants to a strategic planning model and methods for tying resource allocation to community-based outcomes and expectations. At the conclusion of the course, participants present their findings and plans to organizational decision-makers for implementation. “Geographic Intelligence for Fire and Emergency Services Leaders” is a five-week online mediated course that introduces participants to the fundamentals of geographic information and methods for converting information to actionable intelligence that can be acted on by the organization in order to improve fire and life safety outcomes in the community.

Two self-study courses are in process. “Introduction to the National Fire Incident Reporting System 5.0” provides participants with the ability to correctly describe fire service activities using the NFIRS. By doing so, communities can utilize NFIRS data to accurately describe fire department activities, target risk reduction and fire prevention activities, reduce responder risk, and improve emergency response in their communities. “Management Tools for Fire and Emergency Services Leaders” builds upon the “Introduction to NFIRS 5.0” course, providing instruction on how to use common commercially available software applications such as Microsoft Excel to query data, identify trends and make predictions about fire and emergency service needs.

Responder Health and Safety curriculum: Firefighting consistently ranks near the top of America’s most dangerous professions, and the USFA is committed to reducing death and injuries that occur while firefighters are serving their communities. The latest statistics indicate that there is a positive pattern of decline in line of duty deaths. Eight-two firefighters died while on duty in 2018. During the past ten years (2009 to 2018), the U.S. has averaged 91.5 on-duty firefighter deaths per year. Occupational-related cancer deaths continue to be a concern in the fire service.

The revised development of the “Application of Leadership in the Culture of Safety” course is aimed at the first line supervisor who is considered the most important link in the safety culture. This course is part of NFA’s Managing Officer Program. Significant changes have been made to the following courses in light of current and emerging trends and lessons learned: “Safety Program Operations,” “Department Wellness Program,” and “Empowering Responder Wellness” (online). Additionally, several new online mediated courses are in development: “Human Performance Factors for First Responders,” “Behavioral Health in the Fire Service,” and “Occupational Exposures in Today’s Fire Service.”

Training Program curriculum: A new course, “Fire and Emergency Services Training Program Management” was developed, piloted and released. The course is focused on the training management function in fire, EMS and emergency services organizations. Participants analyze the performance capabilities in their organizations, identify performance gaps and develop training management plans to improve the level of performance in their organizations.

Two online mediated courses were introduced for post-pilot delivery. “Integrating Technology into Fire and Emergency Services Training” provides instruction on the evaluation of and correct application of technology in the training environment in order to ensure that instructional technologies are appropriate, supported and effective as a means of improving training and

occupational performance in fire and emergency services. “Training Program Design” follows the Analysis, Design, Develop, Implement, and Evaluate (ADDIE) model of instruction design. The program seeks to improve fire and emergency services course design and delivery in order to improve community emergency services outcomes.

Facilities and support: The National Emergency Training Center (NETC) Management, Operations, and Support Services (MOSS) Division is responsible for managing, operating, and providing administrative and emergency support services for all USFA activities (which includes the NFA and the National Fire Programs Division) and the Emergency Management Institute (EMI) located on the 107-acre campus in Emmitsburg, Maryland.

In FY 2019, the NETC MOSS division provided numerous facilities and support services for 200 federal employees, 200 federal contractors, and approximately 400 students each week from across the nation. Operations and support consisted of, but were not limited to, the following: facility operations and maintenance; renovation and improvements; food services; security; information technology; and student admissions, housing and transportation for NFA, EMI, and FEMA students. On campus in FY 2019 12,850 students completed resident training (NFA 6,036; EMI 5,225 (of which 2,077 were FEMA students); and special groups training 1,589.)

The NETC MOSS Division oversees and maintains a long-term plan for the site as well as a process to achieve NETC's vision of a historic, state-of-the-art, multiuse, student-focused campus. The master plan lays out the existing state of and vision for NETC in a comprehensive and graphic manner that can be referenced when expansion or reconfiguration is necessary. The report establishes a planning framework with specific recommended solutions for identified issues, and it outlines planning standards to help create a sense of place and a destination that presents a professional image and fosters a supportive working environment.

In 2019, NETC MOSS continued to install various energy efficient products on campus to achieve substantial energy cost savings and reduce environmental impacts associated with the facility, greater efficiency and sustainability. The installation of the new fire alarm system in four buildings was completed in Phase 1, lighting upgrades continued, and solar panels were installed on the flat roofs on Buildings R, L and M. All work complied with the Maryland State Historic Preservation and FEMA programmatic agreement.

In mid-July 2019, the NETC Admissions Online Application process was implemented. This multi-year project will reduce or eliminate paper when applying for an NFA or EMI class and reduce manpower required to review and process the applications. The link to apply is: <https://training.fema.gov/generaladmissionsapplication/staticforms/startapplication.aspx>.

Section 4.3 — Activities to Assist the Nation’s Fire Services

(15 U.S.C. § 2215(d))

The USFA provided support and assistance to the nation’s fire services operations and response through the following activities in FY 2019.

USFA Response to Assistance to Firefighters Grant (AFG) Monitoring and Oversight Requirement, §6 of the Reauthorization Act: USFA and AFG Program Office (PO) staff have been working collaboratively to address this requirement. USFA review of the FY 2018 FEMA Monitoring Plan (Plan) determined that actions called for in this Plan meet the legislative requirement for oversight and monitoring of the AFG program. The Plan identifies two areas for monitoring activities – programmatic and financial. Two opportunities for USFA engagement and contribution fall within the programmatic monitoring area. The first is for USFA staff to assist the AFG PO when conducting targeted post-panel reviews. USFA staff began assisting the AFG PO during the FY 2017 Fire Prevention and Safety (FP&S) Grant Program review process and in 2019 continued to assist with the review of FY 2018 FP&S Research and Development applications prior to award. In the second opportunity, USFA and AFG PO staff will work collaboratively to develop an AFG grants management training program that will be hosted on the USFA Learning Management System.

National Fire Academy Board of Visitors: The NFA Board of Visitors (BOV) plays an important role in supporting the academic stature of the NFA. The BOV is charged with the annual review of the NFA programs, and it also provides advice and recommendations to the USFA.

In FY 2019, the NFA BOV:

- Provided oversight and approval of the finalization of the EFO Program rewrite;
- Inspected the NFA physical facility which included the review of the NETC campus upgrades and audits of various NFA resident course deliveries, as well as visiting classrooms;
- Maintained sub-committees and conducted activities addressing the NFIRS, and the NFA’s Professional Development Initiative;
- Conducted two meetings which were efficiently supported by using online conferencing technology and one in-person meeting at the NETC; and
- Developed their annual report.

The culmination of the year’s activities included numerous recommendations for the enhancement of the NFA’s educational program including expanded outreach efforts and the need for increased diversity, upgrades and expansion of the NETC physical facility, continue with the solar panel installation, and support for budgetary increases.

Federal Fire Working Group: The Federal Fire Working Group (FFWG) provides an opportunity for federal agencies to share and discuss one another’s programs, research, and additional resources to promote coordination and collaboration among federal partners. It is the only interagency group within the Federal Government with a focus only on fire and life safety.

The FFWG was established in 2001. The USFA is required to provide federal agency coordination and information exchange activities under Sections 8(e), 12, and 21(e) of Public Law 93-498, October 29, 1974, the Federal Fire Prevention and Control Act. The FFWG provides the forum for USFA to lead that coordination.

Federal Interagency Committee on Emergency Medical Services: The USFA is a statutory member of the Federal Interagency Committee on Emergency Medical Services (FICEMS), established by Congress in 2005 through the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, to ensure coordination among federal agencies supporting local, regional, state, tribal, and territorial EMS and 911 systems. The FICEMS was also created to improve the delivery of EMS throughout the nation.

Wildland and wildland urban interface coordination: The USFA collaborated with the NFPA and various FEMA components to promote the Wildfire Community Preparedness Day. This year marked the sixth anniversary for this activity. According to NFPA, the purpose of the event is to improve a community's ability to withstand and recover from a wildfire, which may also improve the safety of firefighters. Almost 10 million Twitter followers were touched through various social media outreach efforts.

The USFA provides full-time staffing at the National Interagency Fire Center (NIFC) in Boise, Idaho, which enhances interagency functions and technical assistance programs that are critical to wildland firefighting operations. Working directly with the NIFC Office of Predictive Services, interagency partners, and Geographical Area Coordination Centers, the USFA provides technical support on numerous wildland firefighting resource management programs.

Additionally, the USFA has served as the Interagency Coordinator to interface various FEMA national and regional programs with existing programs from the interagency representation at NIFC. Serving as host, the USFA has supported various mitigation, planning, logistics, and grant meetings through the year. The USFA also hosted the annual National Wildfire Coordinating Group (NWCG) Executive Board meeting for the interagency group.

The USFA maintained membership with the following interagency groups: Wildland Fire Leadership Council (the U.S. Fire Administrator is a principal member), NWCG, National Multiagency Coordination Group, Fire Management Board, WUI Mitigation Committee, Fire-Adapted Communities Coalition, Fire Executive Council and Federal Fire Policy Council. Through these groups, the USFA represented the SLTT structural fire and emergency services and encouraged collaboration on how the federal land management agencies and departments manage existing resources, research, technical development, training, qualifications, and mobilizations.

The USFA in collaboration with FEMA, DHS S&T, and other key stakeholders worked to determine what new and emerging technologies could be applied to wildland fire response. Given the loss of life that occurred in the recent California wildfires, the FEMA Administrator asked what technology could be applied to save lives in the wildfire response. This collaborative

effort has developed a Wildland Urban Interface Fire Operational Requirements and Capability Analysis Report, May 31, 2019²⁵ with key findings that will be shared with the broader fire and emergency response communities in an effort to deliver solutions.

Federal operations and National Response Framework: During disaster activations, the USFA deployed staff in the various leadership roles of the FEMA National Response Coordination Center, which included Geospatial Information Specialist, Emergency Services Group Supervisor, Resources and Capability Branch Director, Resource Support Section Deputy Chief, and Resource Support Section Chief as part of the federal response to Tropical Cyclone Dorian, and Tropical Storm Karen.

As a member of the FEMA Emergency Support Function Leadership Group, the USFA contributed to the National Threat & Hazard Identification and Risk Assessment Target Concurrence for Response and Recovery Mission Areas and the guidance and direction for the National Safety and Security Lifelines and Senior Leadership Brief distributed through FEMA.

USFA also supported the Comprehensive Preparedness Guide 101 update effort, participated in the National Risk and Capability Assessment National Target Concurrence revision to the Response and Recovery Interagency Operations Plans, and the completion of the inventory of Federal response capabilities and the draft National Mitigation Investment Strategy.

Type 3 All-Hazards Incident Management Teams: During 2019, the USFA provided development assistance for 64 USFA Type-3 All-Hazards Incident Management Team (AHIMT) O-305 course deliveries that trained 1,644 students for the nation's emergency services. Currently, the USFA maintains contact with 75 AHIMTs throughout the country that represent SLTT incident management teams that establish a robust national capability for emergency services. For professional development and sustainment of established teams, the USFA coordinates with NIFC to provide mentoring or coaching opportunities for AHIMT team members that are position-specific and team-oriented. The USFA continues to support AHIMTs by developing additional exercises, training, and establishing standards for the teams to follow as they respond to national disasters.

Critical Infrastructure Protection: The USFA's Critical Infrastructure Protection Program promotes information sharing and threat analysis with emergency services sector departments and agencies nationwide. The USFA manages the Emergency Management and Response-Information Sharing and Analysis Center (EMR-ISAC), which is a national clearinghouse for critical infrastructure protection and emergent threat information specifically targeted to the nation's emergency services sector personnel. The EMR-ISAC publishes a weekly InfoGram that addresses current issues impacting first responder operations, planning, health, and safety concerns and the challenges of responding during incidents of civil unrest and active shooter situations. In FY 2019, distribution of the weekly InfoGram increased 10.5 percent to more than 105,000 emergency services-sector personnel nationwide.

Additionally, the USFA-managed Emergency Services community of interest on the Homeland Security Information Network (HSIN) has vetted more than 27,000 emergency services sector leaders for access to current situation reports, emerging threat information, public health and

²⁵ https://www.dhs.gov/sites/default/files/publications/wui_fire_report_of_findings_july_24_2019v2_508.pdf.

safety bulletins, cyber and terrorism threats, and other critical “For Official Use Only” information. The USFA also hosts monthly informational webinars on developing trends with state and local fire service personnel that serve as liaisons with their state’s fusion center.

National outreach: The USFA continues to refine the Daily National Operations Briefing that provides an operational snapshot of significant information, emerging issues, all-hazard incidents, special security events, and hazardous weather. Additional information is available to first responders and emergency managers with hyperlinks that are implanted in the document, which allow subscribers to view details and to check for updates. The briefing is distributed to more than 25,600 subscribers.

Section 4.4 — Public Education

(15 U.S.C. § 2215(e))

In FY 2019, the USFA led or participated in the following activities to deliver public education materials and messages that were easily understood by the general public and specific at-risk groups, while emphasizing the whole community concept modeled by the Fire is Everyone’s Fight™ initiative. Additional information is available at <https://www.usfa.fema.gov/prevention/outreach>.

Arson Awareness Week: “Preventing Arson at Construction Sites” was the theme for the Arson Awareness Week and set the stage for significant outreach on this important topic during the week. Although arson fires at construction sites represent approximately 13 percent of all reported arson fires each year, they adversely affect the local community and create a significant fiscal impact on the entities involved. Both residential and commercial properties under construction were addressed.

Buildings under construction or renovation are at their most vulnerable condition and adversely hinder firefighting operations. Two examples of large impact arson-related fires were discussed at the April 9th webinar sponsored by the Insurance Committee for Arson Control. The Da Vinci Apartment complex in Los Angeles, California in 2014 and the Warrington Hotel in Ocean Grove, New Jersey in 2017 were both under construction and intentionally set ablaze.

Takeaways from the Arson Awareness Week presentation included developing site plans and preplanning between the fire service and the contractors, resource links for both investigators and inspectors, educational topics for the involved workforce, and community awareness. The USFA 2019 Arson Awareness Week webpage had 1,516 visits.

Emergency Medical Services Week: “EMS Strong – Beyond the Call” was the theme of the annual Emergency Medical Services Week. EMS Week offers an important opportunity for EMS and fire departments to recognize the dedication of all EMS personnel and the showcase their commitment to protect the health and safety of all Americans. The USFA is proud to support, train, and recognize the accomplishments of all EMS personnel. Additional information is available at https://www.usfa.fema.gov/operations/ops_ems.html.

National Emergency Training Center library: The NETC library focused on a research-to-practice initiative that involved writing brief summaries and capturing key actionable takeaways from recent research articles. The target audience for the research summaries was fire and EMS personnel. The topics included violence towards EMS personnel, wildfire risk mitigation, firefighter cancer screening, assessing cardiovascular disease risk in firefighters, community paramedicine, and nanotechnologies to minimize fire risk. The complete set of content is posted at: https://www.usfa.fema.gov/current_events.

The library provides short training sessions that help students further hone their ability to find, evaluate, effectively use, and cite needed information. Topics include an introduction to the research process — how to cite a reference in accordance with the *Publication Manual of the*

American Psychological Association, sixth edition, accessing full-text scholarly articles and e-books via the library's online database, creating an online search strategy, establishing a research topic, and more.

The library undertook a major collection maintenance project to economize space and remove many hundreds of old, outdated books. This improved management of our space will allow us in 2020 to integrate the operations of the campus publication center into the footprint of the library. Our intent is to transform the current space into a campus common area that houses enhanced and improved library services along with conveniently accessible publication center services. This one-stop shop will be an active draw to students who will have a reading lounge type of experience providing a wide array of print and electronic information products.

Civilian Residential Fire Fatalities: The Prevention & Information Branch undertakes a daily media monitoring effort in order to capture and tabulate in real time, news reports of home fire fatalities from around the country. According to available national fire loss data for 2018, there were 2,560 fatalities that involved unintentional fires. The USFA's Civilian Residential Fire Fatality report recorded 2,334 civilian home fire fatalities during the same period. The intent of the USFA's report is to provide a real time estimate of fire loss in the United States.

Fire and Life Safety Messages: The USFA is involved with a wide variety of outreach efforts in partnership with fire and life safety organizations and agencies. One unique initiative for this report is fire and life safety pictographs. These specially designed tools address the ever-increasing need from our constituents for messages for their at-risk public. We increased the reach of our pictographs by adding more life safety topics, such as bike safety, pool safety and wildfire/outdoor burning fire.

This year, the USFA released 32 new pictographs bringing the total that the USFA has published to 82. They assist fire departments and key fire and life safety stakeholders in teaching fire and life safety to people with low literacy and for those with limited English proficiency. Pictographs can help overcome literacy barriers by communicating messages with pictures. These pictographs help to communicate fire safety messages to high-risk populations. Each was tested nationally with people who have low literacy, as well as those who speak Chinese, Hindi, and Spanish — the nation's largest immigrant groups. The pictographs can be used in educational outreach materials such as flyers, posters, and banners. The USFA created templates to assist departments in creating these outreach materials and a how-to video to teach users how to use the templates. They are available on the USFA website and have been extremely well-received.

The Fire Marshal Interchange: The Fire Marshal Interchange (FMI) was established to provide a platform for fire marshals across the nation to safely communicate within the secure HSIN. Using this site allows for sharing knowledge outside jurisdictions to bring awareness of problems and trends that may threaten the lives of those they have sworn to protect from fire and life safety issues. The world of the fire marshal is always changing. This site is designed to advocate for positive reinforcement of the basic and often complex situations that arise.

The FMI is specifically designed for the fire marshal mindset. The USFA fully supports the collaboration of fire marshals throughout the nation and internationally to help better serve their communities.

Since its release in March 2019, the FMI has garnered 356 active members from federal, state, tribal, county and local municipalities, the Department of Defense, Canada and New Zealand. We are using various marketing tools to advertise the network to the fire marshal community including the USFA website, Gov Delivery, National Association of State Fire Marshals, HSIN, Certified Fire Investigator Trainer Network (CFITrainer.net), International Association of Arson Investigators, Community Risk Reduction (CRRNet), and LinkedIn.com to name a few.

Hotel–Motel National Master List: The Hotel–Motel National Master List, published on the USFA website, is one of the fire and life safety assets created as a result of the “Hotel and Motel Fire Safety Act of 1990.” Only commercial properties that provide lodging to the public and meet the list’s requirements are approved for official travel by U.S. federal government employees. A property can apply to be on the list if it has at least one single-station, hard-wired smoke alarm in each guest room and all conference rooms. If the building is four or more stories tall, fire sprinklers must be in each guest room. The property receives a FEMA ID that can also be used for the Emergency Lodging Assistance Program funded by FEMA.

The Office of Management & Budget (OMB) Collection 1660-0068, Federal Hotel & Motel Fire Safety Declaration Form is in place for the information collection. This renewal process keeps the information collection active on the OMB inventory for three years. The new expiration date is February 28, 2022.

This year we were able to send GovDelivery messages to approved properties in the Hotel-Motel database. The messages went out to all properties that have provided an email address; this was approximately 32,000 for each quarter’s mailing. Our messages included Spring Fire Safety, encouraging emergency messaging in their communities using the Integrated Public Alert and Warning System (IPAWS) to provide customers access to life-saving emergency messaging, fire safety messaging using our new public lodging pictographs, as well as encouraging property managers to ensure their National Master List information is up-to-date.

This year, the USFA added 1,975 new lodging properties to the list, bringing the number of properties to 51,274. The USFA partners with the General Services Administration to assist in maintaining accurate property information.

Digital communications and social media: Our followers on the USFA’s Twitter account (@usfire) totaled 49,200 people. This year we posted over 500 tweets. Our likes on the USFA Facebook page are over 18,800, and we had 145 posts. We added LinkedIn to our social platforms in late 2018. We currently have 3,750 followers and have posted over 100 times. In addition to supporting FEMA digital platforms by sharing/retweeting posts, we participated in several major campaigns on our platforms such as Hurricane Preparedness Week, Arson Awareness Week, and Hurricane Dorian Outreach.

USFA staff sent approximately 600 bulletins to GovDelivery subscribers on community risk reduction, fire prevention and life safety, and available USFA resources, including NFA training. The number of subscribers to one or more USFA email lists is 391,000.

US. Fire Administration’s website: The USFA’s website received 3.2 million visits from 2.3 million unique visitors during the reporting period. A variety of fire prevention outreach materials were added to the USFA’s website including animated social media cards in both

English and Spanish, customizable home fire-safety handouts for local fire prevention campaigns, resources for Arson Awareness Week/Fire Prevention Week/EMS Week/National Preparedness Month, and previously recorded webinars. Also added to the site were 3 social media toolkits and 82 pictographs – illustrations and animations to help overcome literacy barriers by communicating fire-safety messages with pictures.

The USFA continued to publish a series of articles on current events and emergent issues relevant to the fire service to increase national awareness about them. Over 250 content assets on USFA’s website were audited for accuracy, currency, and relevancy.

Fire is Everyone’s Fight®: The USFA’s initiative has 3,068 fire department and organization supporters, including all 50 state fire marshal offices and the District of Columbia. The initiative also partners with Australia, Canada, Denmark, Egypt, England, Guam, Mexico, New Zealand, and South Africa.

Publications Center: The center processed more than 4,000 publication orders, accounting for the distribution of close to 1 million fire prevention and life safety items. The outreach products include booklets, manuals, technical reports, handouts, CDs, and DVDs – many provided in both English and Spanish. In addition to providing hard copy publications upon request, most of the USFA publications are searchable and available for electronic download through the USFA’s website as 508-compliant PDF files. Many of the electronic fire prevention and public education outreach publications can be customized by fire/EMS departments and community organizations for use within their local communities.

The Publications Center saw an increase in on-campus visits and tours from NFA classes. The Publications Center’s presentation provides students with a greater understanding as they navigate the USFA’s vast online catalog of fire prevention and safety-related materials. Visiting students are also provided an online tour of the USFA website’s wealth of assets.

Publications Center staff set up and staffed a USFA publications display during the NFA State Weekends. Staff greeted participants as they checked in for the weekend and provided an assortment of USFA publications, took publication orders, and shared information about the downloadable resources on the USFA website.

The Media Production Center: The center creates a wide variety of communication graphics including 3D animated videos, posters, displays, animated social media messages, presentations, publications, etc., for display on the USFA’s website; in NFA courses, classrooms and on-campus locations; and at conferences, meetings, and course locations across the country. The Media Production Center also supports FEMA’s EMI with communication graphics, posters, displays, and online electronic assets.

U.S. Department of Homeland Security *Blue Campaign* on human trafficking: The USFA supported the *Blue Campaign* by distributing their resources to enhance first-responder awareness of human trafficking. These materials are disseminated at the NETC campus and across the nation at various meetings where the USFA exhibits for first responders and the general public. USFA staff members produced an 11-minute training video for first responders to

recognize the signs and symptoms of possible human trafficking victims. This training video is made available through USFA's YouTube channel. USFA staff members also worked with IAFC staff to present "Human Trafficking: How the Fire Service Can Help" at the annual Fire Rescue Med conference.

Section 4.5 — Fire Safety Effectiveness Statements

(15 U.S.C. § 2215(f))

Although initially a reporting requirement for the USFA, the authority for code enforcement remains at the SLTT levels and is outside the federal purview. The code development and compliance process has evolved since the 1970s and essentially meets the need to provide fire safety standards to which buildings should comply. The USFA continues to support the promotion of codes and compliance through training at the NFA and through staff involvement in the consensus standards process.

Unlike some other FEMA components, USFA does not manage programs that provide funding through grants or have a regulatory framework that allows for incentivizing code adoption or enforcement through program eligibility. USFA is a principal member of the FEMA Building Codes Executive Steering Group. We work closely with the Executive Steering Group and sub-workgroups to develop the agency's building codes strategy and plan for its implementation especially in regard to fire safety and prevention for both structure and wildland fires. USFA also works in collaboration with NIST and non-governmental organizations conducting research to support consensus standards such as NFPA, ICC, and the Insurance Institute for Business and Home Safety.

Section 4.6 — Outstanding Problems

(15 U.S.C. § 2215(g))

National Fire Incident Reporting System: Today, there is an increased demand for data/evidence-based decisions and solutions to complex problems; the fire problem in the U.S. is one such problem, especially in the WUI. Accurate, comprehensive, and current data is essential for pinpointing issues, forecasting trends, setting goals, and identifying actions and areas of focus.

The NFIRS is the largest incident-based system in the nation. The NFIRS is an invaluable resource to SLTT fire agencies and serves as a leading platform for collecting and analyzing a wide range of all-hazards data from the nation’s fire and emergency services. Today, the NFIRS receives over 28.5 million incident reports annually, of which about 1.2 million are fires. The remaining 27.3 million reports are dominated by EMS responses and public service calls.

The NFIRS also documents increased levels of service demand during disasters. Unfortunately, the NFIRS was not originally created to handle and examine such large national data sets. Expanding the ability to access and analyze the full data collection could improve the measurement of the national capacity for response and the operational effectiveness of SLTT emergency services. In addition, the resulting information could support FEMA and DHS information gathered on natural and man-made disasters.

The data environment has changed significantly since the creation of the NFIRS. The aging system (a FEMA legacy system) is expected to function in the DHS’s high cyber security environment that was never envisioned when the NFIRS was created. Security and data protection mandates continuously evolve in response to safeguarding the system and its assets from vulnerabilities. Emergent security requirements are continuous and demand that resources be first committed to addressing these needs while system enhancements become a secondary priority. Testing of the system’s modernization effort to meet agency IT system requirements has been delayed by the prescribed test environment and its availability.

Obtaining complete incident information from firefighters is an ongoing challenge, and not something the NFIRS or the USFA can enforce or mandate. Participation in the NFIRS is voluntary, and how well or completely the firefighters fill out their NFIRS report involves several factors, such as, how much information is available at the incident scene, proper training on entering NFIRS data reports, or efficiency of the department’s software. Some NFIRS users will enter generic values just to “complete” a report, and the result is the slightly different issue of lesser data quality. In 2018, the USFA’s NFIRS staff continued to promote and directly assist NFIRS users with a set of data quality reports from the NFIRS Data Warehouse. This proactive data quality effort resulted in producing the 2018 public NFIRS data release sooner than in any other previous year. Additionally, USFA offered training for state NFIRS program managers to help them expand the use of the Data Warehouse reports within their states.

State Fire Training Grants: National statistics indicate that approximately 70 percent of the nation’s firefighters are volunteers and 85 percent of the nation’s fire departments are all or mostly volunteer. Volunteer fire departments across the Nation are struggling to retain firefighters while trying to provide lifesaving and important training and education. The USFA has provided small grant funds to state fire training agencies. The 20,000 dollars per state has been critical in providing training to the Nation’s emergency responders. Over time, the decrease

in USFA funds has required the National Fire Academy to redirect funding from course development and delivery to funding this grant, jeopardizing the currency and relevancy of courses delivered through the NFA. In 2019, the USFA suspended grant funding due to increased costs within salary and benefits, and curriculum development and delivery. In 2020, Congress mandated that the USFA provide the grant funding to each state fire training agency at the 2019 level without an increase to the USFA budget to support the grant release. Due to the mandate and no increase in funding to support the grants, the USFA will once again redirect funding from critical areas that support NETC campus maintenance and curriculum review, development, and delivery. To continue in this way will significantly impact the USFA's ability to support the FEMA mission to ready the nation for catastrophic disasters.

Section 4.7 — Recommendations for Additional Legislation
(15 U.S.C. § 2215(h))

None recommended at this time.

Section 4.8 — Suggested Improvements to Fire Prevention and Building Codes

(15 U.S.C. § 2215(i))

The USFA monitors the code change activities of the NFPA and the ICC on an ongoing basis and supports various initiatives with technical expertise as appropriate. The USFA regularly coordinates with our partners in the fire service and the fire prevention community in these efforts. The USFA recommends that local jurisdictions adhere to the latest edition of one of the model building and fire codes promulgated by either the NFPA or the ICC. The codes and standards promulgated by these two organizations include consensus requirements that adequately address home smoke and carbon monoxide alarms, residential fire sprinklers, and fire safety in the WUI using the whole community approach.

V. Section 5 – Triennial Report (15 U.S.C. § 2206(n))

**The Curriculum of the
United States Fire Administration,
National Fire Academy
Triennial Report**

*“Lessons Learned” and
Changes Made During the Period
Fiscal Years 2017-2019*

Section 5.1 — Introduction and Legislative Requirement

(15 U.S.C. § 2206(n))

In the United States Fire Administration Reauthorization Act of 2008, Congress tasked the National Fire Academy (NFA) to report every three years on modifications made to NFA's training and education curriculum. This report is to address "...information about changes made to the National Fire Academy curriculum, including:

- the basis for such changes, including a review of the incorporation of lessons learned by emergency response personnel after significant emergency events and emergency preparedness exercises performed under the National Exercise Program; and
- the desired training outcome of all such changes.”

The United States Fire Administration (USFA) NFA is a directorate within the Federal Emergency Management Agency (FEMA), a component of the Department of Homeland Security (DHS). The USFA's mission is to “provide national leadership to foster a solid foundation for our fire and emergency services stakeholders in prevention, preparedness and response.”

This report is submitted in compliance with that directive on changes that have been made to the NFA curriculum in fiscal years 2017, 2018, and 2019. Excluding this introduction, this report contains the following sections:

FY 2017-2019 National Need and NFA Delivery System Changes: This section provides a brief discussion of emergent needs and new training challenges that surfaced nationally in the period FY 2017-2019, impacted NFA's training curricula, and provides NFA training delivery system changes made during this period.

FY 2017-2019 Changes to NFA Courses by Curriculum Area: This section provides a detailed report of all changes to the NFA curriculum during FY 2017-2019, including all new courses developed and existing courses revised. For the changes in each of the 12 curriculum areas presented, an explanation is provided of the emergent national needs in the nation's emergency services prompting the curriculum changes, the focus and scope of the new and revised courses, the expected training outcomes, and training procedures at the local level. In many cases, the lessons learned are carried over to changes in emergency response.

Samples of How FY 2017-2019 Incident Lessons Learned Have Been Included in the NFA Curriculum: Lessons learned from all hazard incidents, responses, and events in the emergency services are a substantial resource for NFA's curriculum. New protocols, procedures, understandings of risk, and emergency management techniques are incorporated into courses on a routine basis. This effort keeps courses fresh and relevant to the students. These inputs are collected from current national and international events, students, contract instructors, and staff as part of the staff's responsibility to keep their curricula current. Incidents are vetted to identify those that provide opportunities for student job performance improvement. Pursuant to the spirit of the information request by Congress, this section presents a sampling of how the lessons learned from significant incidents during the FY 2017-2019 period have been incorporated into the NFA curriculum.

Section 5.2 — FY 2017-2019 National Need and NFA Delivery System Changes

Emergent Issues and Training Challenges

During FY 2017 through 2019 a number of issues surfaced affecting the nation's fire and emergency services and had broad impact on fire service education, training, and performance improvement. These issues also influenced the NFA curriculum and programs.

Hazardous materials, wildland-urban interface and forest fires continue to be important challenges to fire and emergency services across the United States. The nation's fire service has been embedded in the increase of active shooter incidents and using fire as a weapon. The nation saw the increased transportation of Bakken oil bringing with it an increased need for emergency responders to be better prepared for large scale hazardous materials response. Wildland-urban interface fires continue to grow both in size and numbers. There have been major fires in California, Texas, and Oklahoma in recent years. The USFA is working with the U.S. Forest Service, the National Park Service, NIST, and the NWCG to coordinate training and classes to address this very important issue. The increase in active shooter incidents and using fire as a weapon has caused a need for the nation's emergency responders to be better trained to respond and perform in these highly stressful events. All these issues are being built into curriculum, particularly command and control courses.

In FY 2017–2019, the nation's fire and emergency services continued to face evolving challenges beyond the traditional fire response every day. The NFA's training mission requires that the NFA curriculum keep pace with these dynamic changes in threats to the public. New hazards, response challenges, and lessons learned from responses to these emergent risks were the principal driving forces for the on-going curriculum changes and updates made in FY 2017–2019 that are described in this report.

According to current NFPA statistics, approximately 70 percent of America's firefighters are volunteers, and 85 percent of the nation's fire departments are all or mostly volunteer. Volunteer fire departments are struggling to retain firefighters. The NFA moved to strengthen its development of more online mediated courses. This delivery platform will help to accommodate the limited time fire and emergency services personnel have to attend training. This dramatically helps volunteers attend training. The NFA will continue its expansion of online mediated course development and implementation.

Finally, local fire and emergency services' growing missions have brought about an integration with and support of national response priorities for major disasters, terrorist threats, and other incidents of national significance. These increases have been responsible for additional changes to NFA's curriculum in FY 2017-2019 including lessons learned from:

- The Ghost Ship Warehouse Fire – Oakland, California;
- Pulse Night Club Shooting – Orlando, Florida;
- Route 91 Harvest Music Festival Shooting – Las Vegas, Nevada;
- Thomas and Camp Wildland Urban Interface Fires – Ventura County and Butte County,

California; and

- Hurricanes Harvey, Maria, and Irma; Montecito, California mudslides and flooding in Ellicott City, Maryland.

Plus, many other newsworthy events, as well as large-scale terrorist and disaster exercises at the federal and state level, and the growing requirements for all responders to more effectively use National Incident Management System/Incident Command System (NIMS/ICS) in routine and large incident response have been addressed in the changes to NFA's curriculum.

FY 2017-2019 Curriculum Format and Delivery System Changes

As mandated by Congress, this report documents the changes to NFA's courses and curriculum made in FY 2017-2019. Sections three and four, below, focus on course and curriculum changes designed to improve the quality and impact of the NFA training. However, the courses and curriculum are not the only arenas of change that NFA undertook during that period to improve the quality and impact of its training.

In 2015 USFA analyzed the merits of maintaining an in-person training facility and expanding online training online, including the impact on mission, training efficiencies, and comparison to other federal training entities. The report's conclusion highlighted the diversity of the NFA student population and challenges of reaching many potential students, and the NFA's current strategy of moving incrementally toward distance learning while keeping grounded in classroom instruction provides a well-researched, academically sound, student-focused foundation to deliver education and training to advance the professional development of the fire and emergency services. The NFA continues to move in this direction, but major obstacles related to information technology continue to slow our progress. Conflicts in policies and unclear guidance have stymied progress and led to uncertainty particularly in the area of IT and learning management system procurement. In addition, administrative management of correlated prerequisites, and computer hardware/software costs have also contributed.

Delivery systems that carry courses to the students play an equal part in the overall impact of NFA training, especially given the endemic challenges in reaching many of the nation's fire and emergency services students with critical training. NFA continues to add more online mediated and blended learning opportunities to its curriculum in the form of online pre-course instruction and post-course applications of the material taught in the courses.

Online mediated instruction allows students to engage in a course as their schedule permits while providing instructor interaction in an asynchronous manner. In FY 2019, the NFA increased the number of licenses for its online mediated delivery system by 5-fold, is in the process of converting many classroom-based courses to an online mediated format, and has selected the platform to host the revised EFO program; these changes will better serve the training needs of the nation's fire and emergency services, and broaden the national impact and reach of NFA training.

The NFA continues to use Bring-Your-Own-Device (BYOD) to provide electronic, downloadable student manuals for the NFA's residential classes. To date, the NFA has converted 55 courses to BYOD format helping to reduce printing costs and the environmental impact of paper and ink.

The emphasis on blended learning solutions continues to enhance the richness and diversity of online training offered through NFA Online. Since 2017, numerous online mediated and blended courses were added to the NFA curriculum portfolio and we are currently experiencing exponential growth in the number of online mediated courses offered to our students. Since its launch in late 2007, more than 550,000 students have completed NFA Online courses.

Also, a major overhaul of the Executive Fire Officer (EFO) Program, the flagship program of the NFA, took place. The EFO Program provides senior fire officers with a broad perspective on various facets of fire and EMS administration. The courses and accompanying research examine how to exercise leadership when dealing with difficult or unique problems within communities.

The revisions to this program resulted in eight new classes with four consisting of online mediated learning and four consisting of on-campus residential experiences. The new classes are shown below, along with the path to completion.

Online Mediated:

Executive Leadership: Introduction to EFO and Research Design
Strategic Risk Management Analysis: Organization
Strategic Risk Management Analysis: Community
Applications in the Exercise of Leadership

Residential Courses:

Exercise of Executive Leadership: Self
Exercise of Executive Leadership: Organization
Exercise of Executive Leadership: Community
Integrating Executive Leadership for Self, Organization, and Community

Social media is an important tool and an additional means of engaging students with the NFA programs. During FY 2017–2019, the NFA Coffee Break bulletins continued to provide short reading with high interest topics available online to fire and emergency services personnel. This provides the reader the opportunity to obtain needed information at any time convenient to their schedules. The NFA Coffee Break bulletins are designed to reach large portions of the target audience with current material and information, without presenting any training time footprint or requirement that would disrupt work. The program has drawn a national and international audience. Bulletin content includes EMS, codes and standards, community risk reduction, fire sprinklers, health and safety, leadership, planning, training, and wildland topics. Bulletins are available through NFA’s web page as well as through a noncredit, no fee subscription service. They can also be viewed directly from the USFA’s web page https://www.usfa.fema.gov/training/coffee_break/. During FY 2017–2019, the NFA delivered cumulatively over 18 million noncredit subscription learning opportunities.

In FY 2017–2019 the NFA saw continued enhancements and improvements to the system used to manage the national instructor cadre (instructors who deliver the NFA instructor-led curriculum, both on- and off-campus), and the system used to manage the delivery of courses at the state and local levels. The NFA enhanced its automated course call process to provide state fire training agencies with a more manageable window to forecast their training needs and

provide more course options. Also, this system automates scheduling and provides the NFA staff with the tools to manage course load demand. The NFA continues to add courses to the materials download feature, giving State fire training agencies and contract instructors direct access to Academy two-day and six-day course materials. This provides users with real-time access to up-to-date Academy course material.

Section 5.3 — FY 2017-2019 Changes to NFA Courses by Curriculum Area

Below is an accounting of all changes made to the NFA curriculum during FY 2017-2019. This includes all new courses developed and existing courses revised. These changes are explained for each of the following 12 curriculum areas:

- Incident Management
- Leadership and Executive Development
- Hazardous Materials/Weapons of Mass Destruction
- Emergency Medical Services
- Fire Prevention: Technical
- Fire, Arson and Explosion Investigation
- Fire Prevention: Management
- Responder Health and Safety
- Planning and Information Management
- Fire Prevention: Public Education
- Training Program Management
- Wildland Urban Interface

For each curriculum area, an explanation is provided of the emergent national needs by the nation's emergency services, prompting the curriculum changes. The explanation also lists courses changed, the focus and scope of the new and revised courses, and the expected training outcomes and national impacts to be achieved.

Incident Management

This curriculum addresses the full range of competencies necessary to command and control all hazards incidents. The goal of this program is to foster a nationwide corps of fire and emergency services personnel fully trained and prepared to the NIMS standards capable of commanding responses to incidents of all sizes and hazards. For all levels and complexities of incidents from routine responses to major emergencies, this curriculum addresses the use of the NIMS/ICS, strategic and tactical recognition primed decision-making, and the command skills and techniques needed by the mid- and senior-level officers of the nation's emergency services.

The training is heavily scenario-based. The techniques and command skills taught directly reflect lessons learned in response and command of major incidents, and the material is kept current using new issues stemming from current events. Graphical scenario training is an effective means to transfer important performance skills to those who have less opportunity to experience live fire events.

There were various incidents that caused the Incident Management curriculum to be updated. These incidents involve events such as the West Coast Fires (Camp/Paradise Fire), hurricanes Irma, Maria and Harvey, the Ghost Ship Warehouse Fire, and the mass shooting event (Las Vegas).

In years 2017-2019, three courses were updated in the Incident Management Curriculum:

- “Decision Making for Initial Company Operations”
- “Preparing Initial Company Operations”
- “Strategy and Tactics for Initial Company Operations”

The courses build skills in command and coordination leadership roles, processes, and developing recommended organizational structures for incident management at the complex, operational and incident support levels. The courses within the curriculum support the National Preparedness Goal and work within the NIMS, its principles, and structures to provide a standard, national framework for incident management. Students serve in various positions and unique scenarios to reinforce learning points and develop practical experience and decision-making skills to successfully resolve incidents in a challenging, realistic environment. Within the Incident Management courses, there are exercise-based components which provide interactive learning with simulated major incidents and disasters to the students. The purpose of these exercises is to provide as “real to life” as possible incidents for the senior level students attending the course. The system supports the learning technique to replace and amplify real experiences with guided ones, often “immersive” in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.

Leadership and Executive Development

The courses in the Leadership and Executive Development curriculum are presented in a variety of ways that include on-campus resident courses, online programs in both mediated and self-study formats, and deliveries through SLTT partners at sites throughout the country and U.S. territories. This makes the curriculum available to the largest target population in the emergency services community from first responders to elected officials.

Some courses are specifically targeted to the volunteer fire and emergency services professionals as part of a Volunteer Incentive Program. Additionally, select courses are key components of the EFO program, while others support the Managing Officer (MO) program.

In years 2017-2019, three courses were updated/created in the Leadership and Executive Development Curriculum:

- “Applied Research Design for Fire and Emergency Medical Services;”
- “New Executive Chief Officer;” and
- “Effective Communications for Fire and EMS Success.”

These courses were updated with references to new and emergent issues, managing officer and executive level challenges, senior command lessons learned from major incidents, as well as contemporary thoughts on leadership, organizational dynamics, and professional development.

Hazardous Materials / Weapons of Mass Destruction

Hazardous materials and weapons of mass destruction (WMD) continue to pose a threat to local, state and national jurisdictions. This NFA curriculum area addresses full technical and command training for incidents encompassing hazardous materials and WMD incidents. The goal of this program is to foster national competency through training of all responders so that they can safely and efficiently perform their assigned roles in hazardous materials and WMD incidents while keeping communities safe through mitigation and code enforcement education.

The current Standard of Care for response is driven mainly by the following regulation and standards – OSHA regulation 29 CFR 1910.120 and NFPA 472, 473, 1072 and 475 – which are currently in cycle for revision and updating:

- Recommended Practice for Responding to Hazardous Materials Incidents;
- Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents;
- Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents;
- Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications; and
- Recommended Practice for Organizing, Managing, and Sustaining a Hazardous Materials/Weapons of Mass Destruction Response Program.

During FY 2017–2019, the curriculum was reviewed by subject matter experts that developed improvement recommendations and a five-year plan for currency and relativity maintenance consistent with the mission. The continuing training needs analysis and the inclusion of lessons learned from several major responder and community safety initiatives will assist in meeting the needs of our response community. The NFA has and continues to collaborate with the Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) on the High Hazard Flammable Liquid Train and Pipeline Safety initiatives as well as training and outreach projects.

The NFA has also been involved with the Jack Rabbit project. The USFA/NFA sponsored and hosted two forums after each of the Jack Rabbit I and II field release experiments of ammonia and chlorine to analyze outcomes and develop recommendations for lessons learned and next steps that led emergency response objectives for 2015 and 2016 trials. The information gained from these opportunities have been incorporated into the curriculum, as well as shared with responders nationally. The collaborative effort with development of the Utah Valley University Jack Rabbit website has aided greatly in the distribution of information.

The NFA continues its involvement in the development and revision of the standards and guidance which has provided insight into changes to the professional qualifications for emergency responders which aid in maintaining currency within our curriculum.

In response to the impacts mentioned above and the technological advances in personal protective equipment, air monitoring equipment and ongoing research into the science of catastrophic releases, the Hazardous Materials/Weapons of Mass Destruction curriculum has been revised and new courses have been developed by the NFA:

- Resident Courses
 - “Special Operations Program Management”
 - “Hazardous Materials Code Enforcement”
 - “Advanced Science for Hazardous Materials Response”
 - “Advanced Life Support Response for Hazardous Materials Incidents”
- Resident and Field Courses
 - “Hazardous Materials Operating Sites Practices”
 - “Chemistry for Emergency Response”
 - “Hazardous Materials Incident Management”
 - “Emergency Response to Terrorism: Strategic Considerations”
- Self-Study Online Courses
 - “Hazardous Materials for Inspectors”
 - “Foundational Concepts of Chemistry”
 - “Introduction to Emergency Response to Terrorism”

Emergency Medical Services (EMS)

Fire service-based EMS continues to be a growing sector of local emergency services planning, development and delivery. The USFA Topical Fire Report [*Fire Department Overall Run Profile \(2017\)*](#) reflects that 64 percent of reported calls to fire departments required EMS and rescue services.

Acknowledging this national mission, Congress requires the NFA to play a leadership role in advanced EMS training and program development. The goal of this program is to promulgate more effective EMS program management by the nation’s emergency response community while not competing with state medical authorities and local training organizations that are very successful at delivering hands-on emergency medical field skills.

In FY 2017-2019, the NFA continued review and revision of its EMS curriculum and programs pursuant to Congressional directives. This work included the development of the following courses:

- “Management and Planning of Specialized Operations for Emergency Medical Services” and
- “Mobile Integrated Healthcare Program Management.”

The NFA recognizes future challenges for EMS; these include pre-incident planning for EMS aspects of large-scale disasters, evolving partnerships among different EMS response disciplines, EMS management considerations as part of a national health care strategy, and the challenges of EMS service delivery in tight economic times through evidence-based change. These challenges will continue to be incorporated into curriculum during the on-going course updating.

Fire Prevention: Technical

The modern built environment is sophisticated and complex. New construction materials and techniques – coupled with demands for reduced costs and environmental sustainability – require knowledgeable building and fire codes officials engaged in construction code enforcement. The NFA Fire Prevention: Technical curriculum provides education, leadership, and vision for fire safety providers to reduce the risk of injury and loss of life and property in their communities through effective and comprehensive fire prevention and fire protection/risk management efforts.

Today’s movement toward (and requirements associated with) the use of energy-efficient building components create challenges in the fire protection environment. In addition, as older buildings are repurposed, or new construction initiated, there is a trend toward using building materials that are manufactured using recycled materials and increased building of tall wood buildings. These construction practices bring into question the structural integrity of the material during a fire situation.

Nationally recognized fire and life safety codes, building codes, inspections and standards change every three years. To remain current and respond to these changes, four courses were revised and approved for delivery in FY 2017-2019:

- “Fire Inspection Principles 2: Inspection of Structures and Systems;”
- “Plans Review for Fire and Life Safety;”
- “Certificate of Occupancy Compliance;”
- “Residential Sprinkler Plan Review;” and
- “Commercial Fire Sprinkler Systems Plans Review” (was revised, piloted, and is pending final approval.)

An aging population and moving of this population into existing mid- to high-rise facilities provide challenges for evacuation. The original design of the building may not have been intended to house mobility-impaired individuals. When a fire incident occurs in this type of environment, evacuation is not a fast process, and the risk of injury for occupants and rescue personnel increases. Fire and building codes often do not take the age, health, and mobility of the residents into consideration. The curriculum addresses all levels and complexities of building design, use and occupancy, and the many complex fire protection features and systems that are found in today’s-built environment. The goal of this program is to develop a national corps of fire and building code officials highly trained and prepared to make informed decisions about life safety and fire protection issues that directly impact community safety.

Fire, Arson and Explosion Investigation

The use of fire as a weapon of terror continues to plague some sectors of the United States (see [DHS Action Guide, Fire as a Weapon.](#)) NFA Fire and Investigative Sciences curriculum addresses training in fire and arson investigation, fire science, fire modeling, forensic evidence documentation and preservation, and courtroom testimony. The purpose of this program is to reduce arson loss nationally by improving the investigative science and investigator training in incendiary fire investigations through increased knowledge, arrests, prosecutions, and convictions.

This curriculum is developed and delivered in partnership with the Department of Justice - Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), and includes private partners such as the International Association of Arson Investigators (IAAI), and UL. The resident curriculum follows best practices of adult learning by scaffolding content and relying heavily on classroom instruction, collaborative group exercises, small group student activities, simulation, live burn building scene investigation scenarios, and extensive mock courtroom testimony and cross-examination exercises.

In FY 2017-2019 the curriculum was re-written. Courses were updated and the curriculum was designed as a cohesive track. The revised curriculum includes new naming conventions to simplify the course names and provide continuity to the curriculum. New courses include:

- “Fire Investigation: Essentials;”
- “Fire Investigation: Report Writing;”
- “Fire Investigation: Electrical Systems;”
- “Fire Investigation: Technical Aspects;”
- “Fire Investigation: Case Development and Testimony;”
- “Fire Investigation: Program Capstone;” and
- “Fire Investigation: First Responders.”

The NFA partnership with the DHS S&T continued through FY 2019 with the division using the NFA facilities for operational field testing.

Renovations and improvements to the Burn Laboratory were extensive in 2017 resulting in a safer, cleaner, and functional environment for student activities. In FY 2019, a complete renovation of the individual burn cells was undertaken. The completed and continuing upgrades (eight single cells, two flashover cells, and a complex burn building) have resulted in a live burn investigation facility unlike any other in the federal system or the country. Capabilities include individual burn cells, burn building with multiple burn cell configurations, flashover demonstrator, ventilation pattern demonstrator, vehicle fire burn pad, additional storage, improved student access, area lighting, and a runoff water recovery system.

Fire Prevention: Management

This NFA curriculum area addresses training of mid- and senior-level fire officers and community leaders in managing local community risk-reduction programs. The purpose of this program is to prevent the occurrence of fires, preventable injuries, hazardous materials incidents, and all other preventable incidents in the local community; to mitigate or limit the damage done by fires, natural disasters, and other incidents when they do occur; and to reduce the number of civilian and firefighter deaths and injuries.

To better meet the emergent risk reduction and prevention challenges in today's local communities, the NFA developed four courses during FY 2017-2019:

- “Best Practices in Community Risk Reduction;”
- “Building Organizational Support for Community Risk Reduction;”
- “Introduction to Strategic Community Risk Reduction;” and
- “Introduction to Community Risk Assessments.”

The best way to fight a fire is to prevent the fire from happening. These classes that were developed, revised, or piloted empower the student to make a difference in their community by educating their department and community on the importance of Community Risk Reduction.

Responder Health and Safety

Firefighting consistently ranks near the top of America's most dangerous professions²⁶, and the USFA is committed to reducing death and injuries that occur while firefighters are serving their communities. More than 250 American volunteer and career firefighters died in the line of duty, and thousands more were injured, during FY 2017-2019.

The NFA Responder Health and Safety curriculum works to instill a culture of safety-oriented processes and personal wellness that is built around sound risk management practices. The curriculum focuses on the risk associated with emergency operations and works to balance the whole person approach to safety and risk reduction. This approach focuses safety and wellness as both an individual and organizational challenge. The NFA courses demonstrate to emergency response managers and departmental safety officers there is a clear process towards implementing a positive and proactive safety culture. The courses stress a leadership commitment to safety through actions, training, and education while empowering others to be safe.

To assist in addressing the increased risks to emergency responders, the NFA revised and provided significant changes to the following:

- “Safety Program Operations;”

²⁶ U.S. Bureau of Labor Statistics, Current Population Survey, National Census of Fatal Occupational Injuries in 2018

- “Department Wellness Program;”
- “Fire Service Safety Culture: Who Protects Firefighters From Firefighters?” and
- “Empowering Responder Wellness” (online.)

In FY 2017–2019, training in this area was a high priority because of the increased risks to responders in structural firefighting and other operational responses. The principal increase in structural fire hazards is the result of the combination of new trends for lightweight construction techniques, lightweight materials in the building industry, and the constant evolution of plastics and other synthetics used especially in residential construction. Additionally, energy efficient upgrades such as rooftop solar energy systems present problems for firefighters including electrocutions risks, rooftop ventilation challenges, melted solar panels falling from the roofs, and in some instances, the additional solar system weight can contribute to premature collapse in buildings built to older building codes. These sudden failures create a corresponding increase in reported firefighter “near misses,” injuries, and deaths in structural fire response.

Planning and Information Management

Data and data analysis for local risk assessment, response planning, budgeting, asset management, and emergency response reporting are important tools in the decision-making process. The goal of this curriculum area is to improve response and reduce loss from emergencies by improving data collection and analysis, as well as by using data in the priority-setting decision making process, resulting in reduced community risk to all-hazards and enhanced all-hazards response planning and preparedness.

To help the fire and emergency services address the imbalance between service demands and resource capabilities, the following courses were revised, piloted, and approved for delivery:

- “Analytical Tools for Decision Making;”
- “Emergency Resource Deployment Planning (Standards of Cover);”
- “Executive Planning;”
- “Fire Service Financial Planning;”
- “National Fire Incident Reporting System: Program Manager;”
- “Decision Making and Financial Management;”
- “Geographic Intelligence for Fire and Emergency Services Leaders;”
- “Introduction to the National Fire Incident Reporting System 5.0;” and
- “Management Tools for Fire and Emergency Services Leaders.”

Communities continue to examine response planning models to determine if current deployment and activity models meet community needs and expectations. The fire and emergency services will have a continued need to address an imbalance between service demands and resource capabilities through the middle of the century, requiring a greater need for data analysis and altered service delivery models to meet community needs.

Fire Prevention: Public Education

The goal of this curriculum is reduction of risk, and life and economic losses at the local level through fostering improved public education and risk reduction. This comprehensive curriculum deals with a variety of contemporary issues in community risk reduction with the emphasis on public education.

In FY 2017-2019, the NFA continued review and revision of its Fire Prevention: Public Education curriculum and programs pursuant to Congressional directives. This work included the development of “Fundamentals of Fire and Life Safety Education.”

This online mediated course was developed in response to the 2017 curriculum needs assessment report. It empowers learners to deliver programs that facilitate measurable learning outcomes resulting in behavioral change. It features a section on how to strengthen partnerships with local schools, so fire and life safety education becomes a key component of an educational institution’s essential core curriculum and is evaluated accordingly.

Training Program Management

The Training Management Program is designed to provide emergency services trainers, program managers, and leaders with the necessary education to enhance their skills, develop training programs, and manage training programs in order to improve operational efficiency, enhance responder safety, manage the training function, and describe and defend the training function.

The following courses were revised, piloted, and approved for delivery:

- “Training and Professional Development Challenges for Fire and Emergency Service Leaders” and
- “Training Program Design.”

These courses will help enable local fire and EMS training officials to build effective programs in their own departments.

Wildland Urban Interface

In 2013, the NFA staff conducted a gap analysis through meeting with our wildland fire partners in Boise, Idaho. The result of the meeting and on-going discussions led to the development of a WUI/Fire Adapted Communities Program. Federal agency wildland data shows a drastic increase in lives lost, acres burned, dollar losses, and a negative impact to the landscape over a 10-year period. To assist the Nation’s fire and emergency services with addressing the growing WUI fire challenge that has increased throughout the landscape, the NFA developed and piloted three new courses:

- “Introduction to WUI Evacuation Planning;”
- “Introduction to Adopting WUI Regulations;” and
- “Introduction to WUI Land Use Planning.”

WUI is a national problem. The NFA has adapted to this by developing courses that help fire and EMS personnel be prepared before, during, and after a WUI incident.

Section 5.4 — FY 2017-2019 Samples: Incident Lessons Learned Added to the NFA Curriculum

Lessons learned from incidents, responses, and events in the emergency services are resources for much of the NFA’s curriculum. New protocols, procedures, understandings of risk, and emergency management techniques are being incorporated into the courses on a routine basis. NFA has used the case study method throughout its history with great success.

There are many incidents that are reviewed by NFA course managers and incorporated into the different course curriculum each year; the volume of reporting on all such changes far exceeds the scope of this report. These inputs are collected from current national and international events, students, contract instructors and staff as part of their responsibility to keep the curricula current.

First Responder Suicide

INCIDENT: In 2014 research by the National Fallen Firefighters (NFFF) showed that firefighters, EMTs, and officers took their own life at a rate higher than line-of-duty deaths.

LESSON LEARNED: Incorporating mental health along with physical health in the Responder Health and Safety Curriculum. In November 2019 the NFA created a new position that solely focuses on Health and Safety. The Training Specialist has put a focus in the curriculum on the mental health of the first responder.

NFA COURSES CHANGED: “Health and Safety Program Manager” and “Safety Program Operations.”

DESIRED LEARNING OUTCOME: For the students to identify the signs from first responders displaying a mental health crisis. The implementation of a department Health and Wellness program that would include mental health hygiene. This will strengthen the first responder community to look for the signs and refer them to a medical professional when there is a concern for suicide.

2018 Hurricane Season

INCIDENT: In 2018, the Florida Panhandle saw eight hurricanes during the regular season. Hurricanes Michael and Florence devastated the Florida coast with 155 and 140 mph winds respectively. Houses and businesses were destroyed, vehicles were lifted and tossed to new locations, roadways were closed, and sewer systems failed. According to the National Centers for Environmental Information, Michael and Florence caused more than 75 fatalities and \$45 billion worth of damage combined.

LESSON LEARNED: In the Gulf of Mexico, hurricane events may be frequent, but some qualify as high impact. If available data is gathered and processed accurately, emergency resources can be managed more effectively in the future.

NFA COURSES CHANGED: The NFA created a series of new Community Risk courses, including the online self-study “Introduction to Community Risk Analysis.”

DESIRED LEARNING OUTCOME: Students are exposed to variables that differentiate the levels of incident severity (insignificant to catastrophic). The course is designed to help learners at several skill levels understand how to contribute to the Community Risk Assessment process.

2016-18 Ellicott City Floods

INCIDENT: In June 2016, six inches of rain fell very quickly on Ellicott City, Maryland, sending several feet of water surging through the city's low-lying historic district. In September of 2016, the Jacob France Institute estimated the floods reduced economic activity in the county by \$42.4 million and labor income by \$18.1 million. The retail and food services industries sustained the largest impact, with 50 percent of businesses on Main Street being forced to close for six months as a result of damage from the flood. In total, the 2016 flood has cost Howard County \$14 million in response and recovery as well as repairs to flood walls. Another historic flood hit the city in May of 2018 resulting in one fatality and additional economic losses.

LESSON LEARNED: When the average person considers a community's vulnerability levels, they may focus on indicators like terrain, weather patterns, and infrastructure. It is also important to consider a variety of economic mechanisms, including long-term budget concerns in order to develop the most accurate vulnerabilities picture possible.

NFA COURSE CHANGED: The NFA created a series of new Community Risk courses, including the online self-study "Introduction to Community Risk Analysis."

DESIRED TRAINING OUTCOME: Students are exposed to variables that contribute to a community's vulnerability levels, including economic considerations. The course is designed to help learners understand how a variety of factors contribute to the Community Risk Assessment process.

2018 Paradise Camp Fire

INCIDENT: The fast-moving 2018 Paradise Camp fire displaced numerous communities and destroyed towns and homes in a matter of hours. The evacuation of 52,000 residents caused jammed highways and over-crowded emergency shelters. A new social fabric had to be established as existing communities were destroyed and people with different cultures and practices were forced to live in small spaces.

LESSONS LEARNED: This fast-moving incident required the NFA to adjust the way Community Risk Reduction is approached. There are strategies that can be put into place by communities, households, and businesses to protect structures and loss of life.

NFA COURSE CHANGED: The NFA created a series of new Community Risk courses, including the online self-study "Introduction to Strategic Community Risk Reduction."

DESIRED TRAINING OUTCOME: Students are exposed to variables that differentiate the levels of incident severity (Insignificant to Catastrophic). The course is designed to help learners at several skill levels understand how to contribute to the Community Risk Assessment process.

2018 Parkland Shooting

INCIDENT: On February 14, 2018, a shooter entered Marjorie Stoneman Douglas High School in Parkland, Florida and shot 34 people, killing 17 of them. Within hours of the incident, members of the NFA staff contacted multiple response agencies and arranged to travel to the area to gather lessons learned related to fire and EMS response to the incident.

LESSON LEARNED: Lessons learned from the incident, including pre-, during-, and post-incident activities related to fire and EMS were gathered and have been incorporated into NFA curricula. In addition, an incident after action report is used in whole or part in a variety of courses and has been shared with students.

NFA COURSES CHANGED: Lessons learned have been incorporated into a number of existing NFA courses and will be included in a course currently under development, “Planning for Catastrophic and Unusual Incidents and Special Events.”

DESIRED LEARNING OUTCOME: The report approached the incident using the Haddon Matrix, identifying activities to reduce the impact of active shooter/hostile events, allowing the lessons learned to be incorporated into curricula as appropriate.

VI. Acronyms

| | |
|-----------------|---|
| AFG | Assistance to Firefighter Grants |
| AHIMT | All-Hazards Incident Management Team |
| BOV | Board of Visitors |
| CEUs | Continuing Education Units |
| CMC | Curriculum Management Committee |
| CVVFA | Cumberland Valley Volunteer Firemen's Association |
| CY | Calendar Year |
| DHS | U.S. Department of Homeland Security |
| EFO | Executive Fire Officer |
| EMI | Emergency Management Institute |
| EMR-ISAC | Emergency Management and Response-Information Sharing and Analysis Center |
| EMS | Emergency Medical Services |
| FEMA | Federal Emergency Management Agency |
| FESHE | Fire and Emergency Services Higher Education |
| FFWG | Federal Fire Working Group |
| FICEMS | Federal Interagency Committee on Emergency Medical Services |
| FMI | Fire Marshal Interchange |
| FY | Fiscal Year |
| HSIN | Homeland Security Information Network |
| IAFC | International Association of Fire Chiefs |
| ICC | International Code Council |
| ICS | Incident Command System |

| | |
|---------------|---|
| LNG | Liquified Natural Gas |
| MIH | Mobile Integrated Health |
| MO | Managing Officer |
| MOSS | Management, Operations, and Support Services |
| NETC | National Emergency Training Center |
| NFA | National Fire Academy |
| NFIRS | National Fire Incident Reporting System |
| NFPA | National Fire Protection Association |
| NIFC | National Interagency Fire Center |
| NIMS | National Incident Management System |
| NIST | National Institute of Standards and Technology |
| NWCG | National Wildfire Coordinating Group |
| OMB | Office of Management & Budget |
| PHMSA | Pipeline and Hazardous Materials Safety Administration |
| SAFER | Staffing for Adequate Fire and Emergency Response Grant |
| UL | Underwriters Laboratories |
| U.S.C. | United States Code |
| USFA | U.S. Fire Administration |
| WUI | Wildland Urban Interface |