NIOSH Fire Fighter Fatality Investigation and Prevention Program

Tim Merinar - Tom Hales

Public Stakeholder Meeting
November 19, 2008

National Institute for Occupational Safety and Health (NIOSH)

- Federal agency created under the OSH Act of 1970
- Conducts research and makes recommendations to prevent work-related injury/illness

CDC

NIOSH

National Institute for Occupational Safety and Health (NIOSH)

- Part of the Centers for Disease Control and Prevention (CDC) -
- Research to practice thru recommendations

  Not regulatory
- DHHS – NIOSH / DOL – OSHA

CDC

NIOSH Fire Fighter Fatality Investigation and Prevention Program

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FFFIPP Overview

- Funded by Congress in 1998 to address the continuing national problem of occupational FF fatalities
- Appropriated funds to implement a FF Safety Initiative.
- Focus is on independent investigations of FF LODDs based on 1998 Stakeholder meeting input

CDC

NIOSH Fire Fighter Fatality Investigation and Prevention Program

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NIOSH

Div of Safety Research

Injury Investigations
Morgantown, WV

Div of Surv, Hazard Eval, & Field Studies

CVD Investigations
Cincinnati, OH

National Personal Protective Technology Lab

SCBA Investigations
Pittsburgh, PA

CDC

NIOSH Fire Fighter Fatality
Investigation and Prevention Program

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The FFFIPP Mission

- Prevent FF deaths and injuries
- Formulate recommendations
- Facilitate recommendation implementation

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FFFIPP Goal & Objectives

Goal

- Prevent fatalities

Objectives

- Investigations
- Identify causal factors
- Recommendations
- Interventions
- Dissemination

NIOSH

FFIPP Staff

- **Trauma investigations- Morgantown, WV**
  - Paul Moore, Steve Berardinelli Jr, Matt Bowyer, Virginia Lutz, Steve Miles, Jay Tarley, Stacy Wertman, Tim Merinar,
  - John Sines – IT support,
- **Medical investigations (primarily heart attacks)- Cincinnati, OH**
  - Tom Hales, Tommy Baldwin,
- **SCBA Evaluations – NPPTL, Pittsburgh, PA**
  - Vance Kochenderfer

CDC

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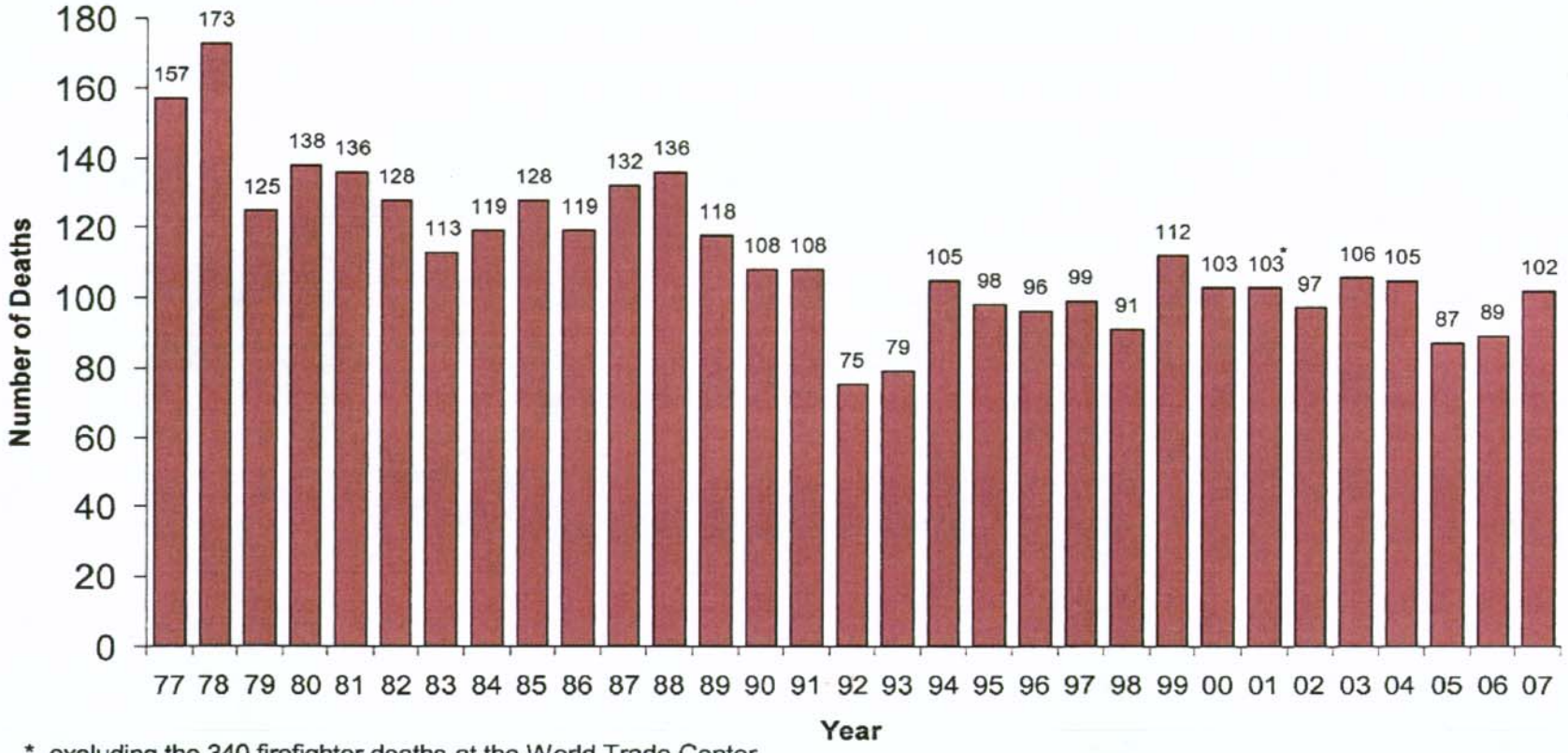
On-Duty Firefighter Deaths - 1977-2007

Ave = 112



* excluding the 340 firefighter deaths at the World Trade Center

Source: NFPA 2007

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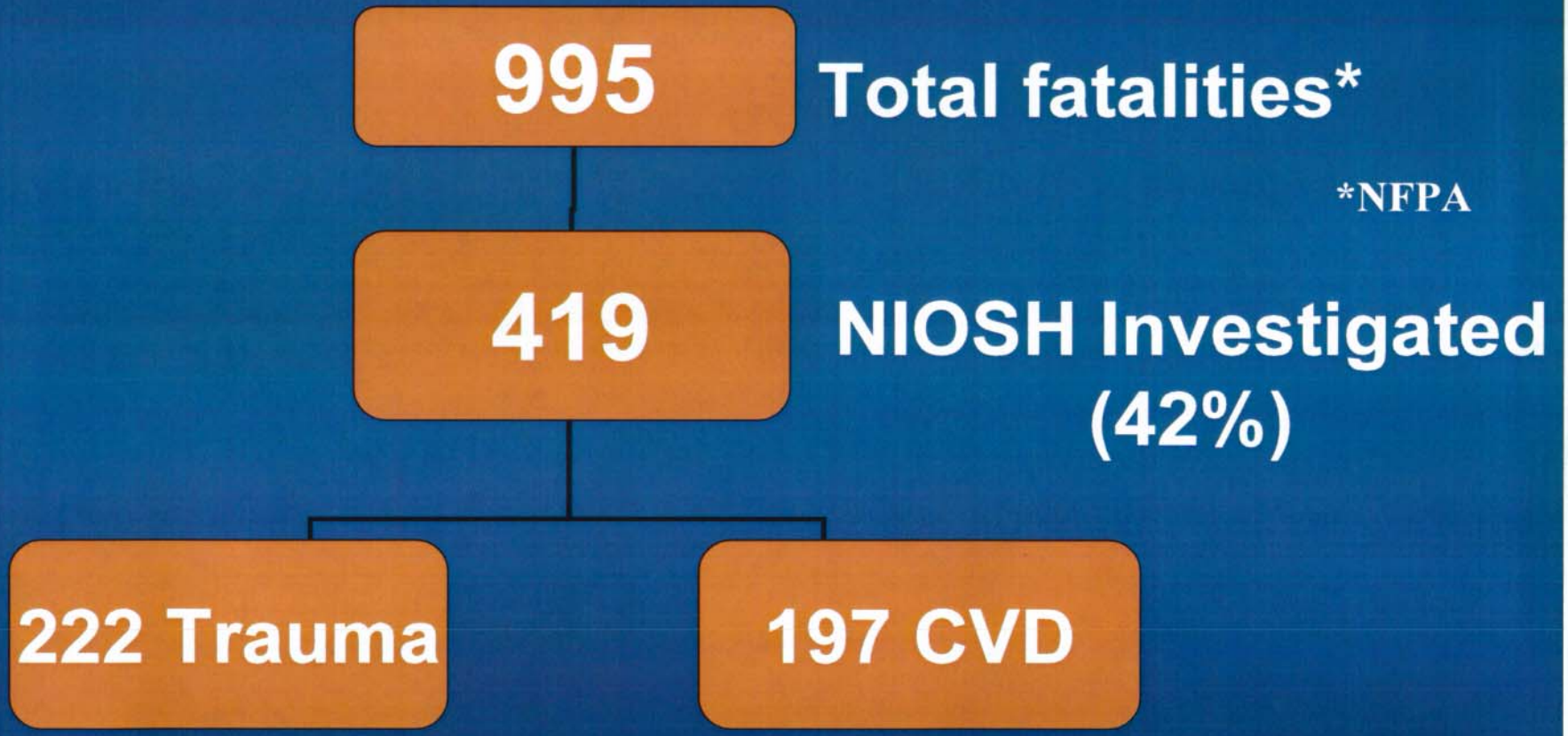
Investigations 1998 – 2007



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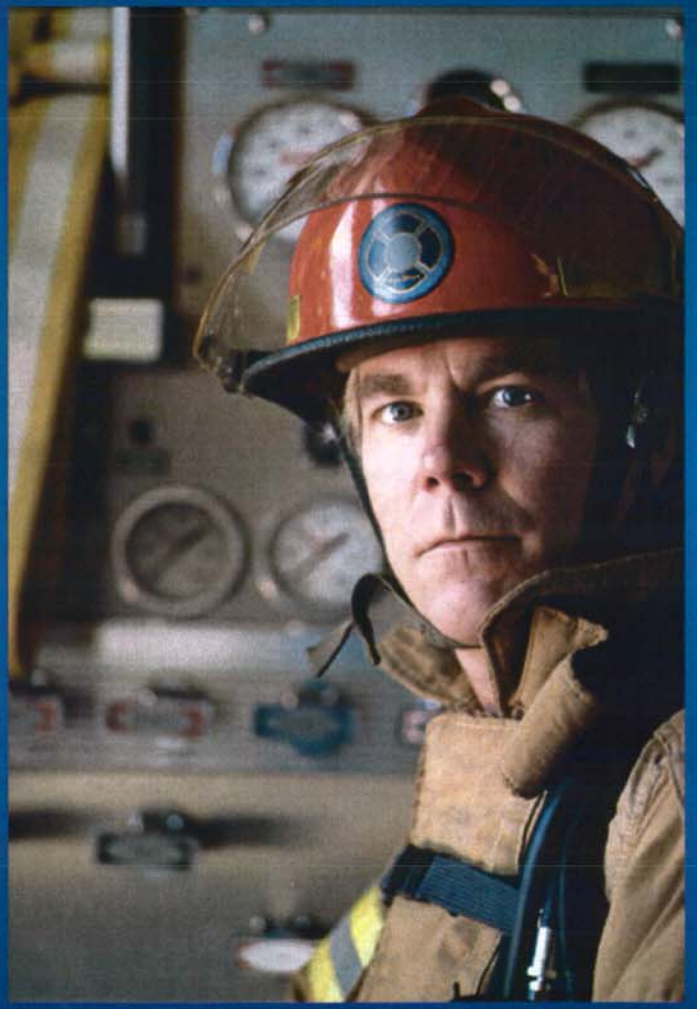
Welcome Stakeholder Input

- Jan 1998 Mtg
- Mar 2006 Mtg
- **Nov 2008 Mtg**
- 2010 Input



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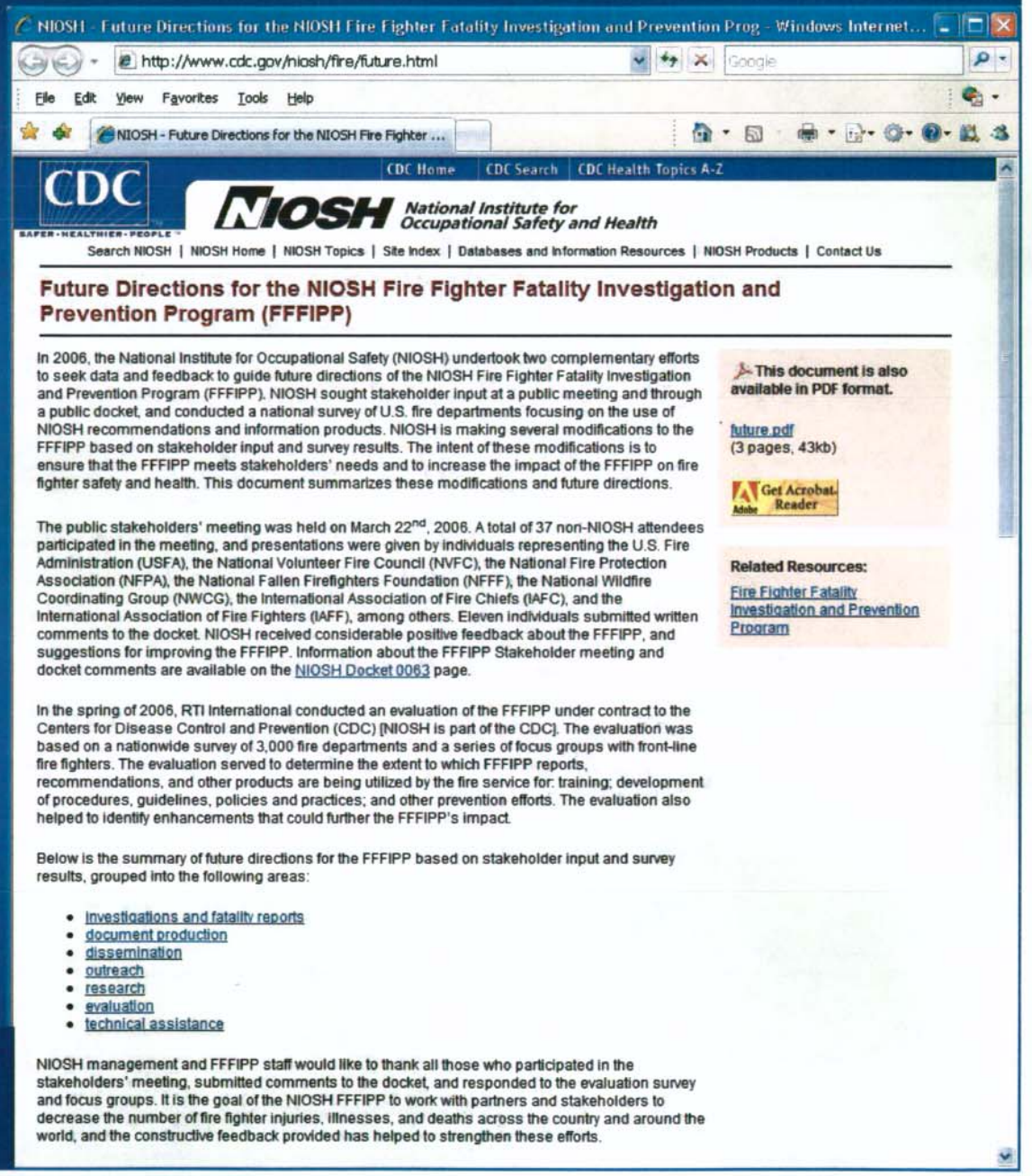
Stakeholder Input

- 2006 Stakeholder Meeting
- RTI Evaluation Report
  - ☞ Future Directions Document
- Program Reviews
  - ☞ IAFC SH&S Task Force
  - ☞ OIG Report

FFFIPP Future Directions

- Investigations
- Documents
- Dissemination
- Outreach
- Research
- Evaluation
- Tech Assistance



CDC

Traumatic Investigations

- **Progress and Changes since 2006 Public Stakeholder meeting**

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FFFIPP Future Directions

- **Investigations**
- Documents
- Dissemination
- Outreach
- Research
- Evaluation
- Tech Assistance

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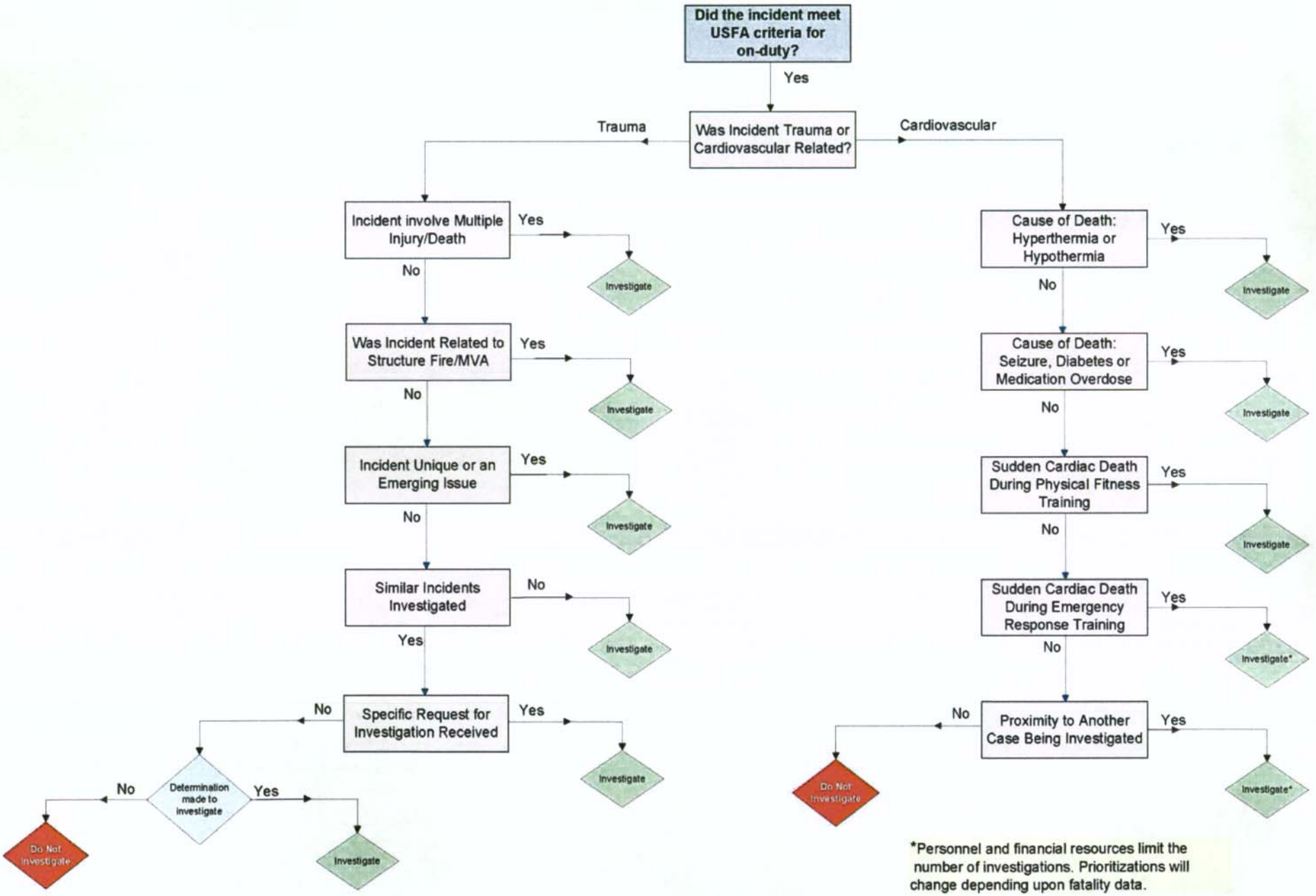
Fire Fighter Fatality Investigation and Prevention Program Prioritization Guideline – 2007*



*Personnel and financial resources limit the number of investigations. Prioritizations will change depending upon fatality data.

LODD Report

Traumatic LODD

-Multiple LODD incidents
-Structure fire
-MVA
-New or Emerging Hazards

Medical LODD

-Hyper/Hypothermia
-Seizure, Diabetes, or Overdose
-Physical Fitness Training
-Responder Training

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FFFIPP Future Directions

- **Investigations**
  - Training
  - Safety Culture
  - Fire Dynamics

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More timely investigations

- 1998 – 2006 ~ 33 days
- During 2008 ~ 15 days
- FDs often request a delay

CDC

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Investigation and Prevention Program

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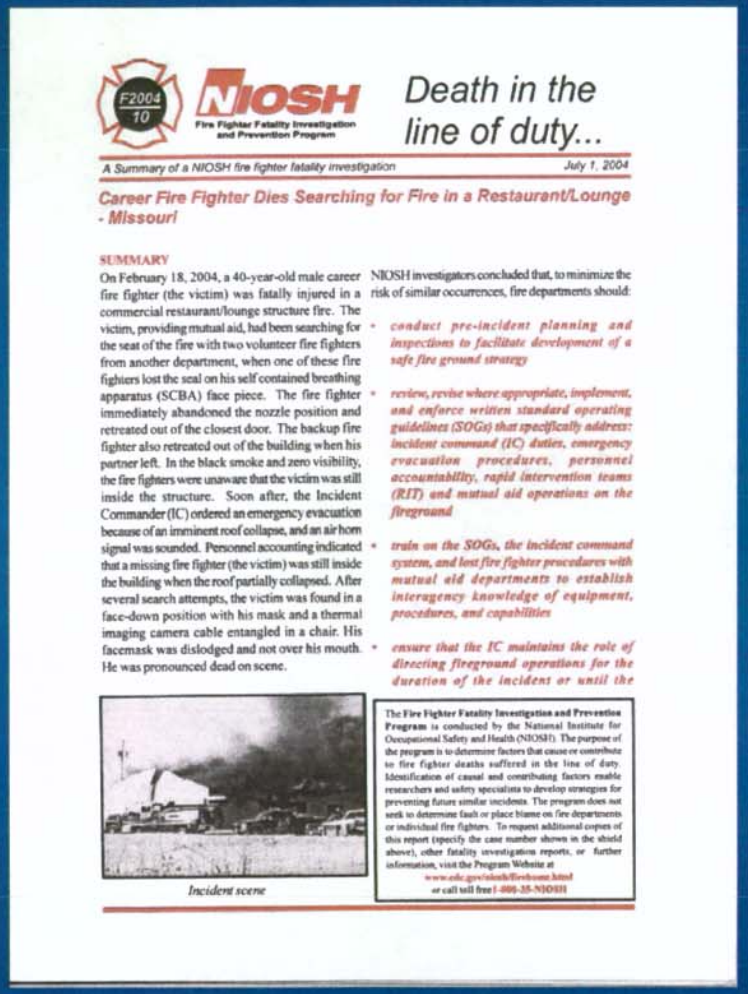
Investigation Reports



F2004 10

NIOSH Fire Fighter Fatality Investigation and Prevention Program

Death in the line of duty...

A Summary of a NIOSH fire fighter fatality investigation *July 1, 2004*

Career Fire Fighter Dies Searching for Fire in a Restaurant/Lounge - Missouri

SUMMARY

On February 18, 2004, a 40-year-old male career fire fighter (the victim) was fatally injured in a commercial restaurant/lounge structure fire. The victim, providing mutual aid, had been searching for the seat of the fire with two volunteer fire fighters from another department, when one of these fire fighters lost the seal on his self contained breathing apparatus (SCBA) face piece. The fire fighter immediately abandoned the nozzle position and retreated out of the closest door. The backup fire fighter also retreated out of the building when his partner left. In the black smoke and zero visibility, the fire fighters were unaware that the victim was still inside the structure. Soon after, the Incident Commander (IC) ordered an emergency evacuation because of an imminent roof collapse, and an air horn signal was sounded. Personnel accounting indicated that a missing fire fighter (the victim) was still inside the building when the roof partially collapsed. After several search attempts, the victim was found in a face-down position with his mask and a thermal imaging camera cable entangled in a chair. His facemask was dislodged and not over his mouth. He was pronounced dead on scene.

NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should:

- *conduct pre-incident planning and inspections to facilitate development of a safe fire ground strategy*
- *review, revise where appropriate, implement, and enforce written standard operating guidelines (SOGs) that specifically address: incident command (IC) duties, emergency evacuation procedures, personnel accountability, rapid intervention teams (RIT) and mutual aid operations on the fireground*
- *train on the SOGs, the incident command system, and lost fire fighter procedures with mutual aid departments to establish interagency knowledge of equipment, procedures, and capabilities*
- *ensure that the IC maintains the role of directing fireground operations for the duration of the incident or until the*

Incident scene

The Fire Fighter Fatality Investigation and Prevention Program is conducted by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the program is to determine factors that cause or contribute to fire fighter deaths suffered in the line of duty. Identification of causal and contributing factors enable researchers and safety specialists to develop strategies for preventing future similar incidents. The program does not seek to determine fault or place blame on fire departments or individual fire fighters. To request additional copies of this report (specify the case number shown in the shield above), other fatality investigation reports, or further information, visit the Program Website at www.cdc.gov/niosh/firehome.html or call toll free 1-800-35-NIOSH

- **> 380 total reports**
- **Each report mailed to FD (and union) experiencing death**
- **Periodic mailings of selected reports to approx. 35,000 fire departments**
- **Available on NIOSH Webpage**

CDC

NIOSH Fire Fighter Fatality Investigation and Prevention Program

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Stakeholder Input

- Subject Matter Expert (SME) involvement
  - NIOSH investigators
  - Consultants to NIOSH
    - PPE evaluations
    - Aerial ladder truck
  - Reports Peer reviewed

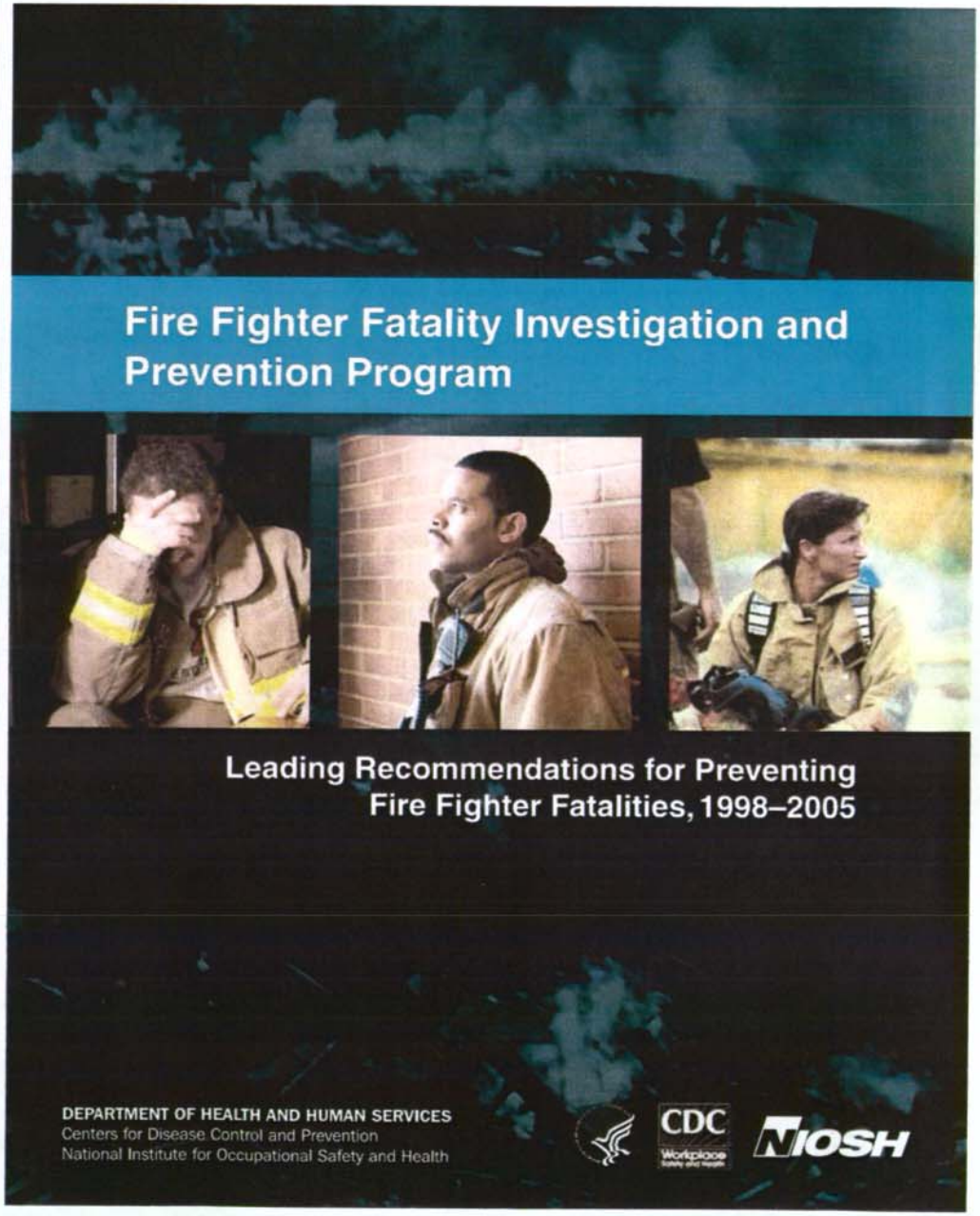
Open Investigations

- 49 Open Investigations
- 62 total LODDs
  - 33 cases involving 46 traumatic LODDs
  - 16 medical LODDs
- Investigator turnover

FFFIPP Future Directions

- Investigations
- **Documents**
- Dissemination
- Outreach
- Research
- Evaluation
- Tech Assistance

CDC



WORKPLACE SOLUTIONS

From the National Institute for Occupational Safety and Health

Preventing Deaths and Injuries of Fire Fighters Working Above Fire-Damaged Floors

Summary

Fire fighters are at risk of falling through fire-damaged floors. Fire burning underneath floors can significantly degrade the floor system with little indication to fire fighters working above. Floors can fail within minutes of fire exposure, and new construction technology such as engineered wood floor joists may fail sooner than traditional construction methods. NIOSH recommends that fire fighters use extreme caution when entering any structure that may have fire burning beneath the floor.

Description of Exposure

Fire fighters are at risk of falling through fire-damaged floors. Floors may fail within minutes of flame contact. Experimental studies and NIOSH investigations suggest that engineered wood floor systems will fail sooner than traditional sawn lumber floors. This danger increases with carpet, ceramic tile, lightweight concrete, and similar floor coverings that add weight and provide insulation because the floor may not feel warm.

Engineered wood I-joists represent a rising technology in the building sector; they offer several advantages over traditional construction methods. Engineered wood I-joists are typically prefabricated using sawn or structural composite lumber for the top and bottom flanges (usually 1 ½ to 3 ½ inches wide) and plywood or oriented strand board (OSB) sheathing for the vertical web (3/8 to 7/16 inches thick) (see Figure 1).

In typical residential construction, a standard 2" × 10" solid wood joist (see Figure 2) is replaced by an engineered wood I-joist 9½ inches deep. Solid wood joists and engineered wood I-joists vary slightly in net dimension and cannot be used interchangeably in the same assembly. Engineered wood I-joists are lighter, stiffer, and will not warp, twist, or shrink like traditional framing materials. Engineered wood I-joists also reduce total construction time and labor costs by their ease of installation. Engineered wood I-joists have grown in use since the early 1990s and by 2005 were estimated to be used in more than half of all wood-frame construction [APA 2005]. Irreversible changes in the building construction industry driven by technological advancements and societal needs suggest that the use of engineered wood products will continue to grow.

Figure 1. Engineered wood I-joist. *Photo courtesy of APA-Engineered Wood Association.*

The engineered wood I-joist has a different cross-sectional profile than a standard solid sawn wood joist, and in limited testing, burned more quickly. Typically, the thinner web was consumed first (see Figure 3). Limited

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

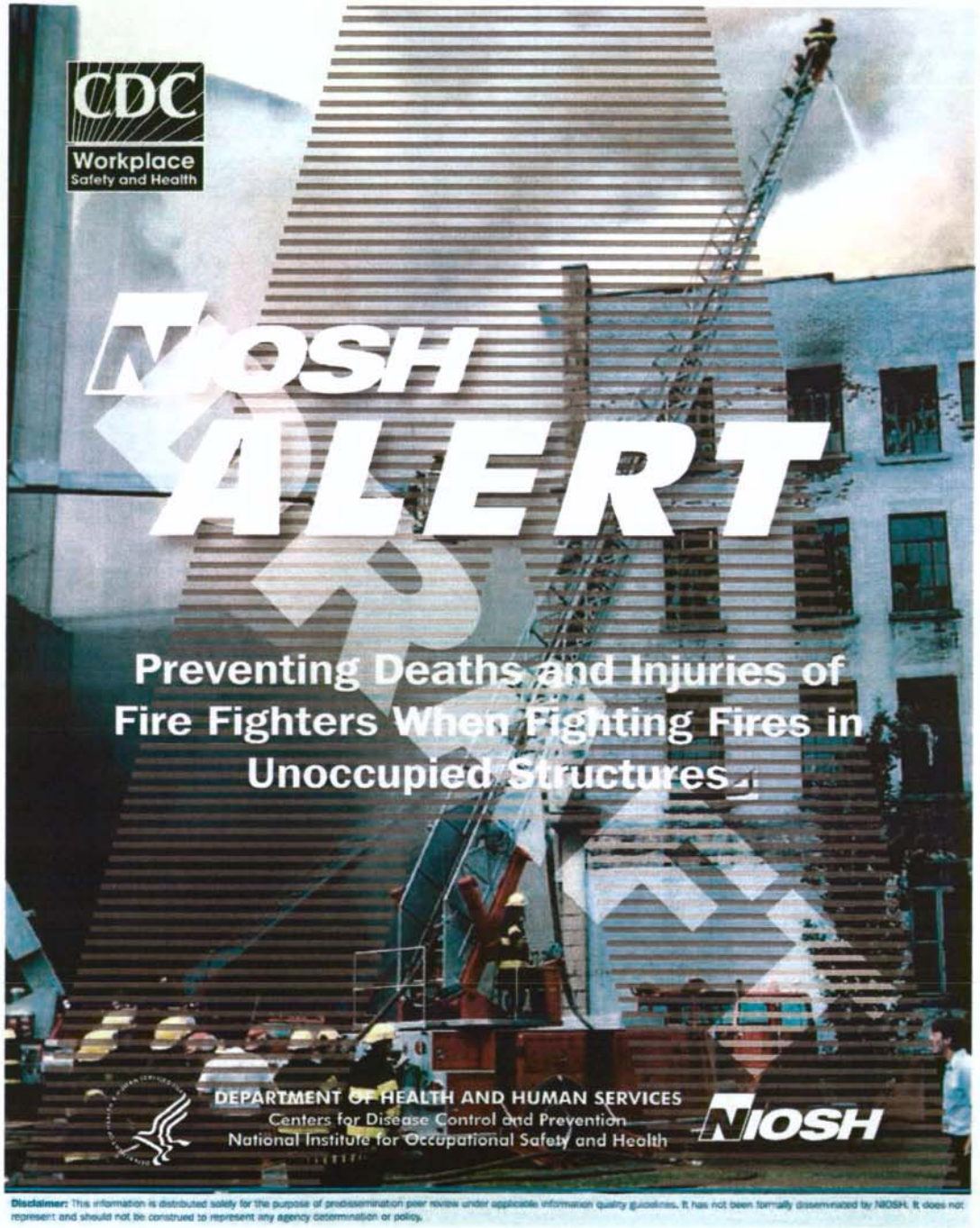
CDC NIOSH

Workplace Solutions

Submitted for Final Clearance

Expected release by early 2009

NIOSH



Risk vs Gain Alert

Posted for peer review

Expected release spring 2009

NIOSH

May 2008 Safety Advisory on Improper Set-up of Aerial Ladder Waterways

SAFETY ADVISORY

Fire Fighter Fatality Investigation and Prevention Program NIOSH

May 08, 2008

Improper Set-up of Aerial Ladders with a Locking Waterway May Put Fire Fighters at Risk

NIOSH recommends that all fire departments utilizing aerial ladder trucks with locking (pin-anchored, lever actuated, clamped) waterways immediately take the following actions to reduce the risk of fire fighters being struck by unsecured waterways or parts of the waterway:

- **Ensure that Standard Operating Procedures (SOPs) and/or Guidelines (SOGs) on setting up multi-position waterways include steps to properly position the waterway and to inspect and verify that the locking mechanism (anchoring pin(s), lever, clamps, etc.) are properly installed and functioning as designed before pressurizing the waterway.**
- **Properly train and practice the correct method of securing waterways and verifying they are secured (per manufacturer's recommendations).**

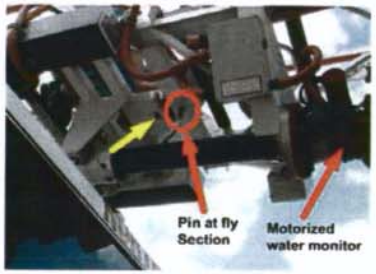


Photo 1 - A properly seated pin at the fly section for defensive water stream operations is highlighted in the red circle. The hole behind it (yellow arrow) shows the location where the pin would be inserted (from the top) to keep the monitor assembly back at the second ladder section for rescue mode. **NOTE:** Various methods are used throughout the fire apparatus industry to secure the waterway; this picture represents a pin-anchored waterway design.

NIOSH is currently investigating an April 8, 2008 fire fighter line-of-duty-death that illustrates that adhering to manufacturer recommended set-up procedures for aerial ladder operations is paramount to ensuring fire fighter safety. Preliminary findings in this investigation suggest that some equipment designs do not provide secondary stops for the waterway on aerial adders. **Thus, failure to properly secure the waterway in the proper position can lead to catastrophic waterway failure and possible serious or fatal injury to fire fighters working in the area.** The pin-anchored waterway design involved in this particular investigation is not limited to a single model or apparatus manufacturer. NIOSH is aware of at least 7 similar incidents that occurred in Delaware, Michigan, New Jersey, Texas, Virginia and Ontario without serious injury. Newer aerial ladder trucks may incorporate different types of anchoring mechanisms and/or a more fail-safe design but proper set up still needs to be verified before operation.

Circumstances of incident under investigation by NIOSH

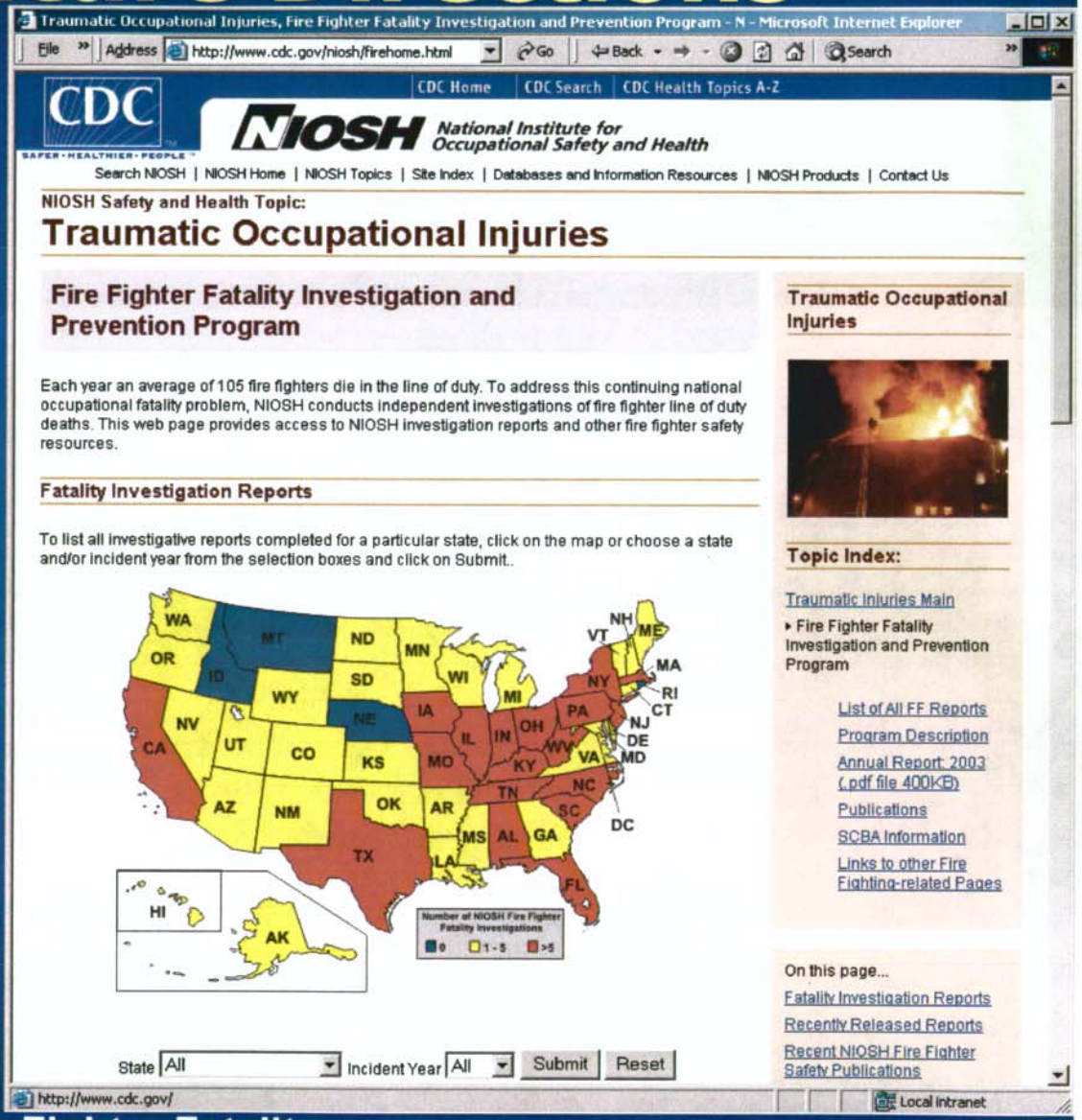
On April 8, 2008, a volunteer Deputy Fire Chief (the Incident Commander), was killed when struck by a motorized water monitor and 30 feet of aluminum pipe that was "launched" off an elevated aerial ladder at a fire at an industrial manufacturing plant in Pennsylvania. The truck was normally transported in the "rescue mode" with the monitor pinned to the second section of ladder so that the waterway would not be in the way if the ladder was set up for rescue operations. At the incident scene, when the waterway was pressurized, the monitor and its support bracket, along with the last 30-foot section of pipe were "launched" off the aerial ladder by the force of the water pressure in the pipe. The monitor flew approximately 75 feet and fell, striking the Incident Commander on the head, killing him instantly. After the incident, the anchor pin was found on the ground, in front of the truck's cab. The waterway did not include any secondary mechanical stops to prevent the separation of the water monitor in the event the anchoring pin was not properly seated. The NIOSH Fire Fighter Fatality Investigation and Prevention Program is currently investigating this incident and a full report will be available at a later date.

- **Preliminary findings**
  - **several models without back-up safety devices and not an isolated incident**
- **1 month after incident**
- **Recommendations for procedures and training**

NIOSH

FFIPP Future Directions

- Investigations
- Documents
- **Dissemination**
- Outreach
- Research
- Evaluation
- Tech Assistance



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NIOSH Fire Fighter Fatality Investigation and Prevention Program

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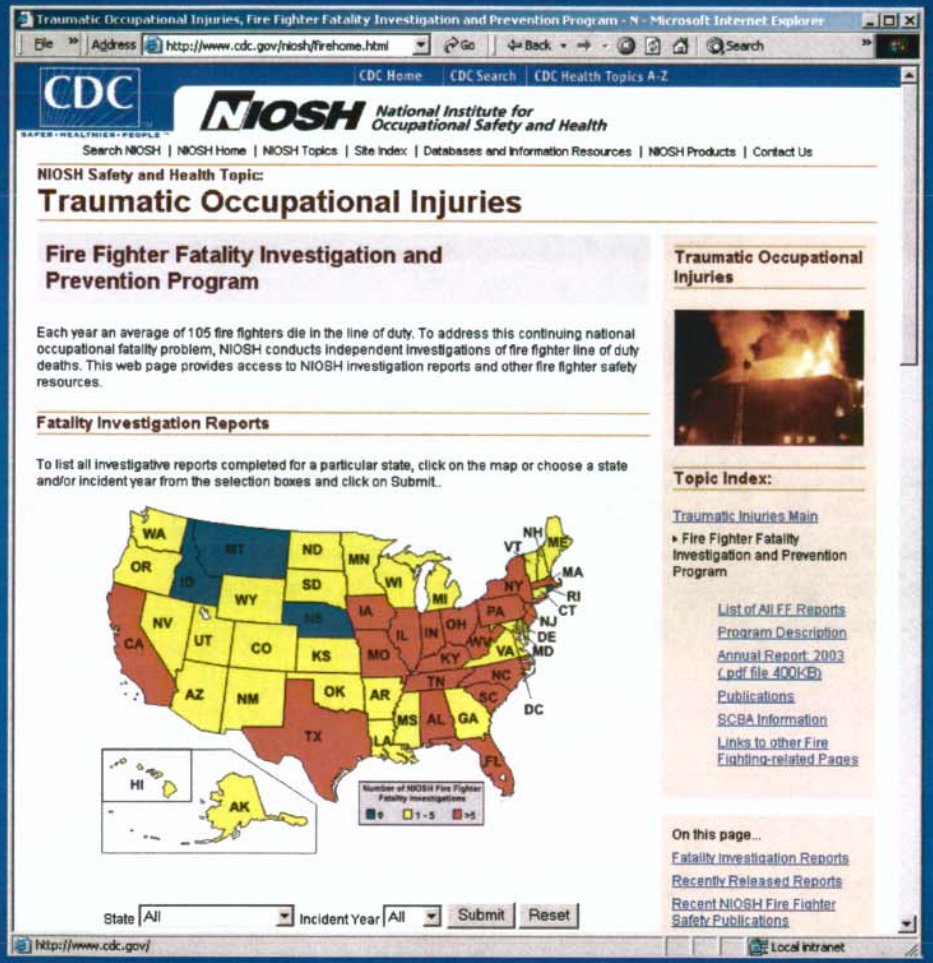
Internet Resource



- **All fatality investigation reports and publications**
- **822,287 visits to webpage or specific investigation reports in 2007**

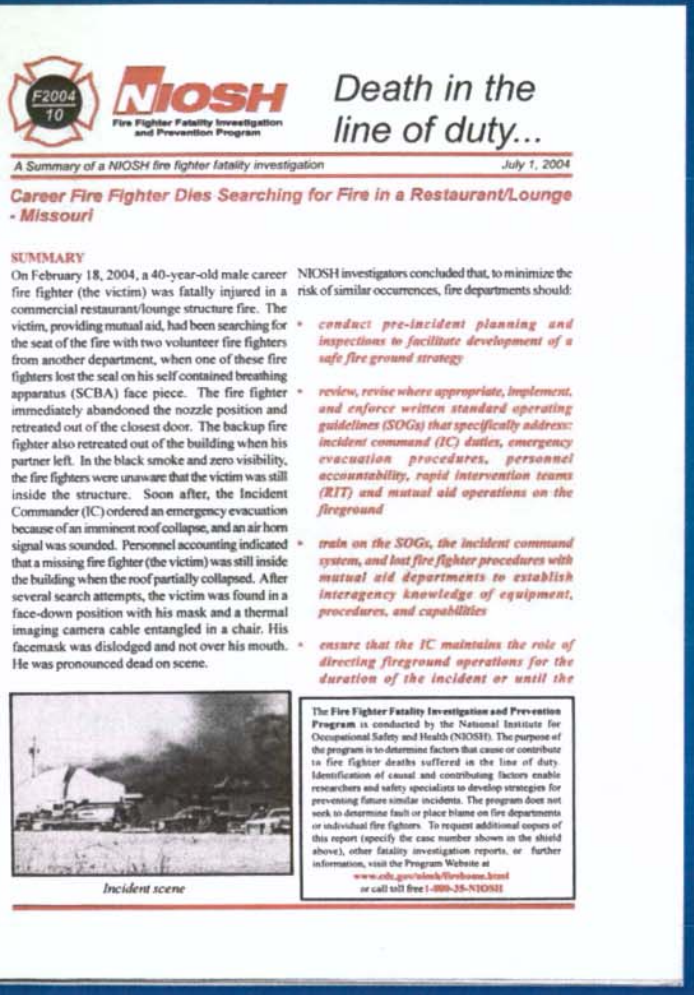
- http://ww.cdc.gov/niosh/fire/

CDC

NIOSH Fire Fighter Fatality Investigation and Prevention Program

NIOSH

Report Dissemination



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NIOSH Fire Fighter Fatality Investigation and Prevention Program

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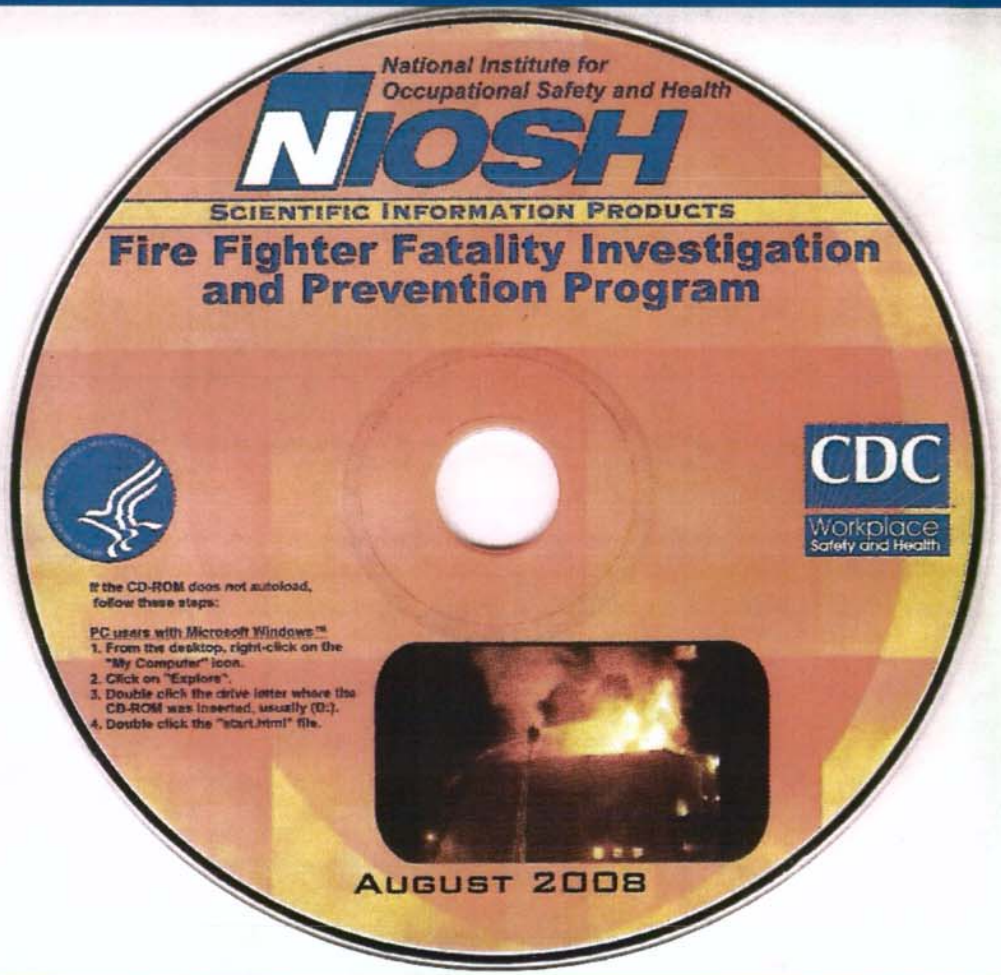

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NIOSH Fire Fighter Fatality Investigation and Prevention Program

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Reprinting of Investigation Summaries in Fire Service Journals

Approx. combined circulation of 300,000

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Stakeholder Input

- **Identify and disseminate equipment problem information**
  - ☞ **Aerial Ladder Truck LODD**
  - ☞ **Safety Advisory posted ~ 1 month**
    - ☞ **Field investigation / SME participation**
    - ☞ **Draft Advisory with peer review**
    - ☞ **Expedite clearance approval process**
  - ☞ **Framework set for future cases**

FFFIPP Future Directions

- Investigations
- Documents
- Dissemination
- **Outreach**
- Research
- Evaluation
- Tech Assistance

Outreach to Stakeholders

- NIOSH Liaison to IAFC SH&S
- NIOSH Liaison to NVFC
- Contact with FDSOA
- NFPA Committee work
  - ☞ 1500, 1852, 1981,
  - ☞ 1982 PASS issues

NATIONAL FIRE SERVICE SEAT BELT PLEDGE

Comment on ISO FSRS 2009 Proposal

FIRE SUPPRESSION RATING SCHEDULE

ISO

CDC

Outreach to Stakeholders

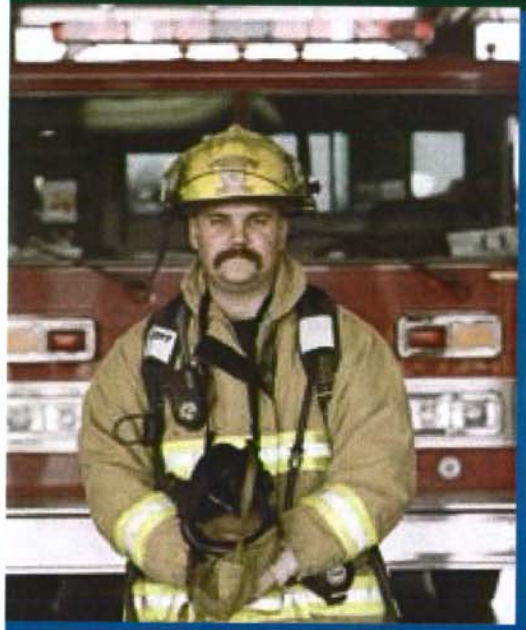
- **Conferences and Presentations**
  - IAFC FRI 2006, 2007, 2008
  - IAFF Biannual Meeting 2006 & 2008
  - IAFF Redmond Symposium 2007
  - NIST FIRE Conference 2006, 2007, 2008
  - Northern VA Professional FOA 2008
  - Colorado State Fire Chiefs (Dec 2008)

Outreach to Stakeholders

Department of Health and Human Services
Centers for Disease Control and Prevention

National Institute for Occupational Safety and Health

NIOSH Science Blog



As NIOSH enters the 10th year of the Fire Fighter Program we are working to better reach small and rural fire departments with the results of our fatality investigation reports and prevention recommendations. We request your assistance in helping us achieve this goal. Please see the questions at the end of this blog and provide your input in the comment section below

http://www.cdc.gov/niosh/blog/index.htm

NIOSH Fire Fighter Fatality Investigation and Prevention Program

FFFIPP Future Directions

- Investigations
- Documents
- Dissemination
- Outreach
- **Research**
- Evaluation
- Tech Assistance

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FF Research

- Anthropometric study
- Boot size study
- Wildland FF Inhalation

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FFFIPP Future Directions

- Investigations
- Documents
- Dissemination
- Outreach
- Research
- **Evaluation**
- Tech Assistance

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NIOSH Fire Fighter Fatality
Investigation and Prevention Program

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Fire Fighter Fatality Investigation and Prevention Program Evaluation

Executive Summary

June 2008

Prepared for the

National Institute for Occupational Safety and Health

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The findings and conclusions in this report are those of the authors, and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

*RTI International is a trade name of Research Triangle Institute.

RTI Report

NIOSH

FFFIPP Future Directions

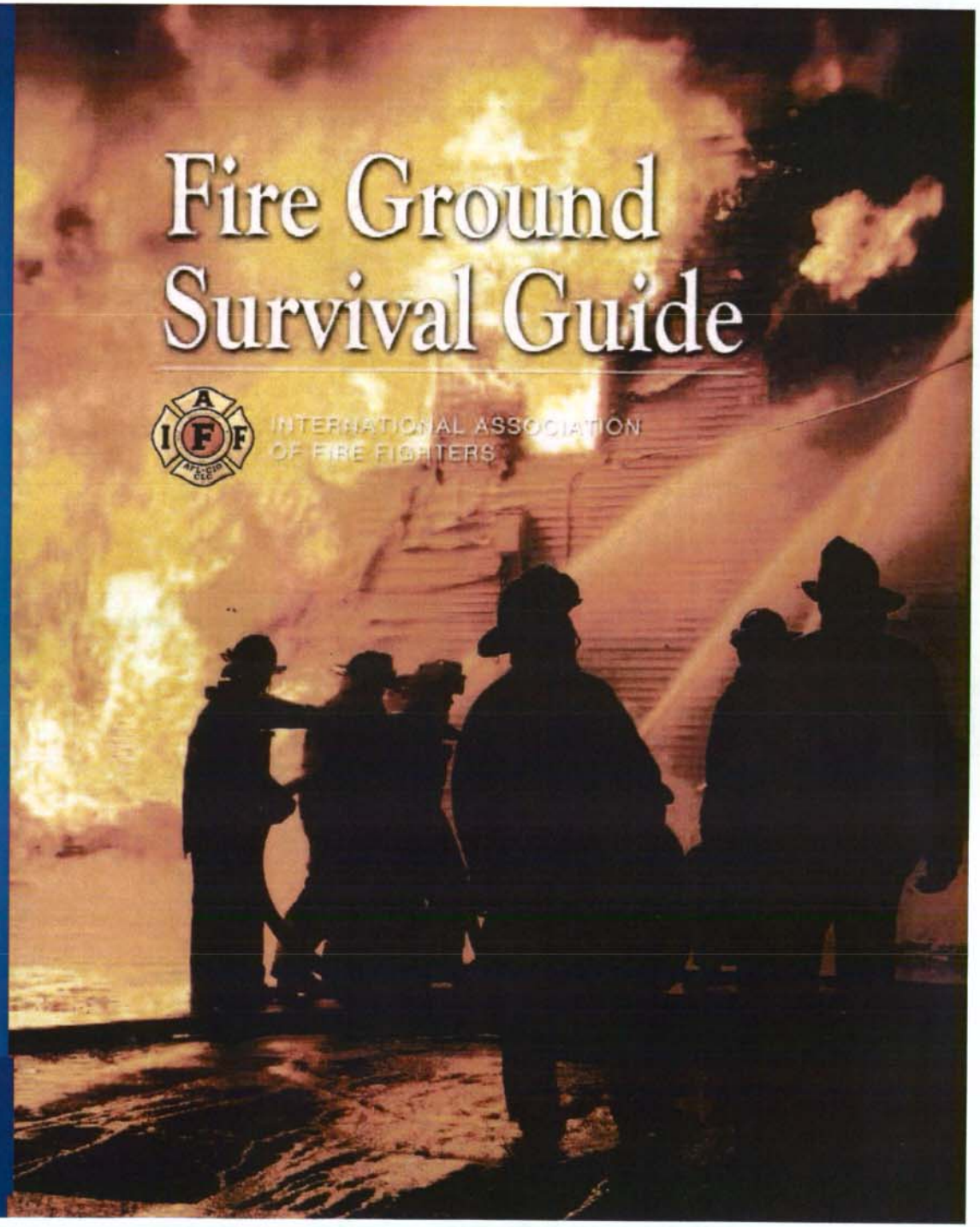
- Investigations
- Documents
- Dissemination
- Outreach
- Research
- Evaluation
- **Tech Assistance**

CDC

IAFF Fire Ground Survival Guide

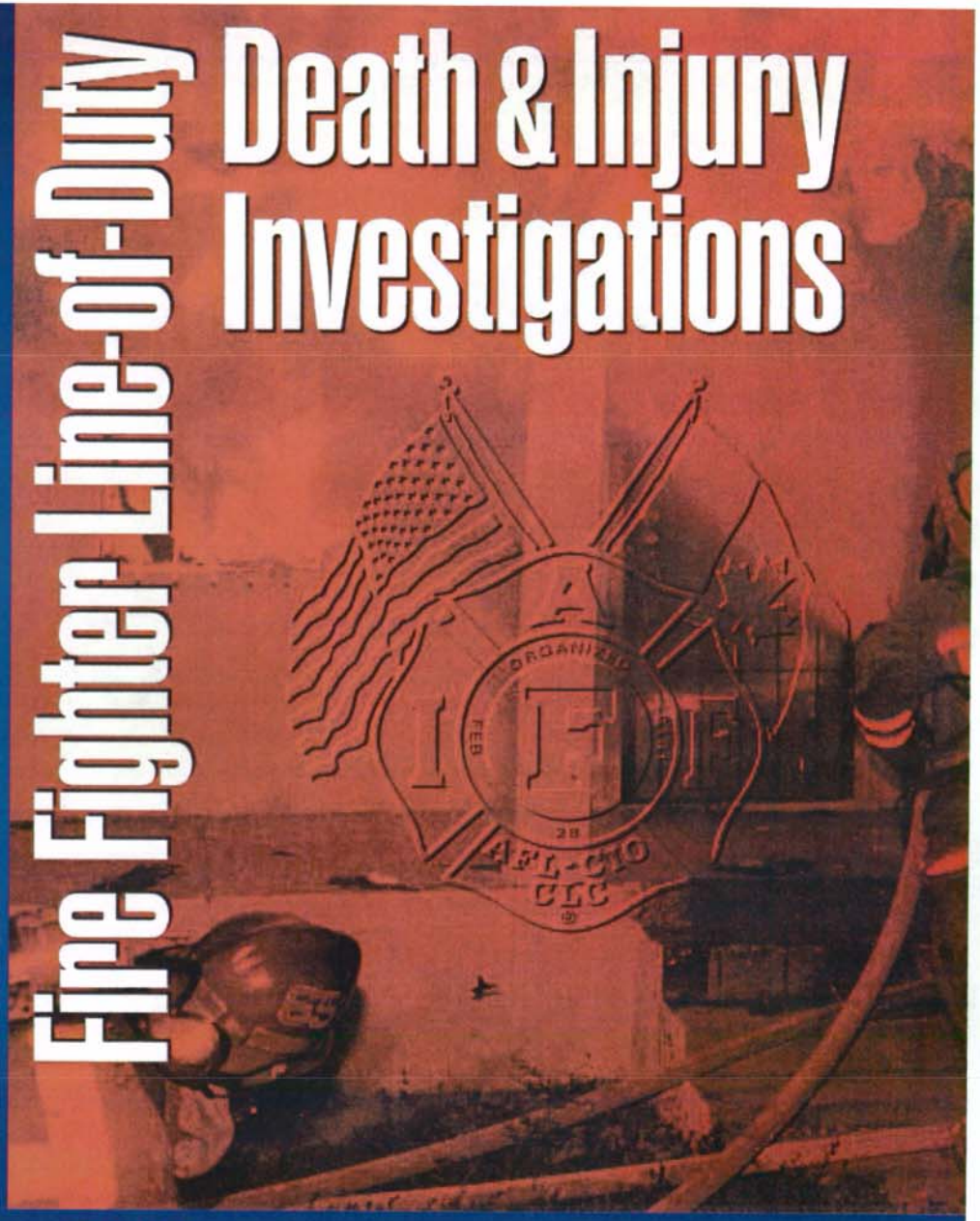
March 2008 Presentation at the NFA EFO Graduate Symposium

CDC



IAFC / IAFF LODD Investigation Manual

Fire Fighter Line-of-Duty Death & Injury Investigations



NIOSH Fire Fighter Fatality Investigation and Prevention Program

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Technical Assistance to Stakeholders

- Review DHS/USFA Fire Grant Proposals
- DHS Advanced First Responder Locator Working Group.

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NIOSH Fire Fighter Fatality Investigation and Prevention Program

NIOSH

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This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines. It has not been formally disseminated by the National Institute for Occupational Safety and Health. It does not represent any agency determination or policy.

Dr. Thomas Hales

NIOSH National Institute for Occupational Safety and Health

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Investigation and Prevention Program

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NIOSH FF Program:
Changes in the Cardiovascular Disease (CVD) Component

Thomas Hales, MD, MPH
Tommy Baldwin, CSP

CDC

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Investigation and Prevention Program

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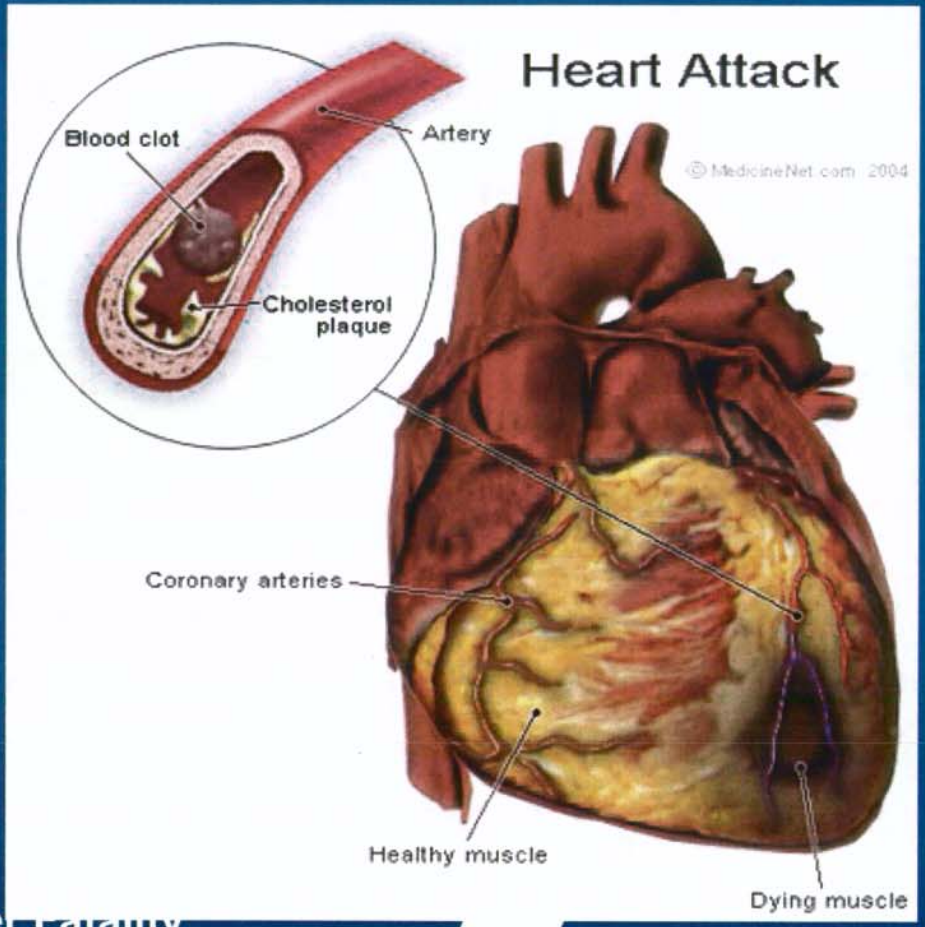
2006 Stakeholder Meeting
Future Directions

- Investigations
- Documents
- Dissemination
- Outreach
- Research
- Evaluation
- Technical assistance



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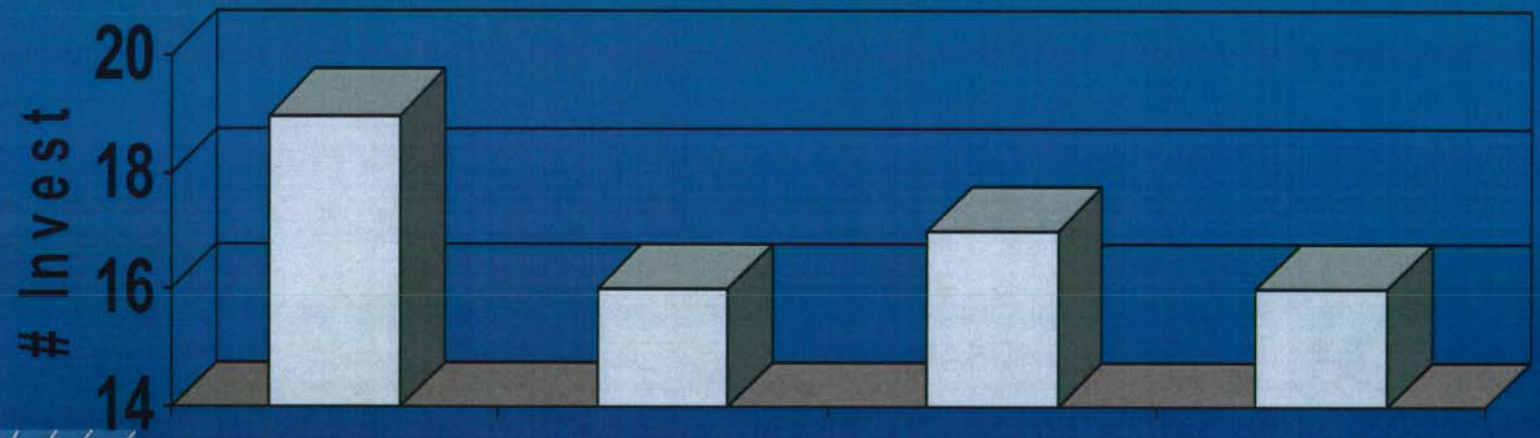
Cardiac Investigations & Reports

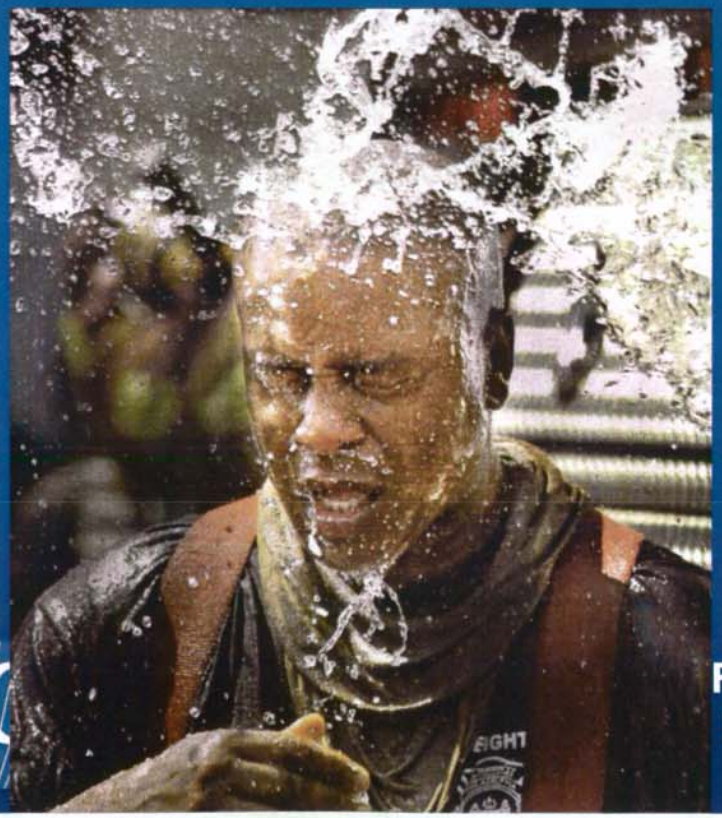
- Main focus
- Current level

Why? Level funding X 10 years



Cardiac Investigations & Reports

- Transparent prioritization process



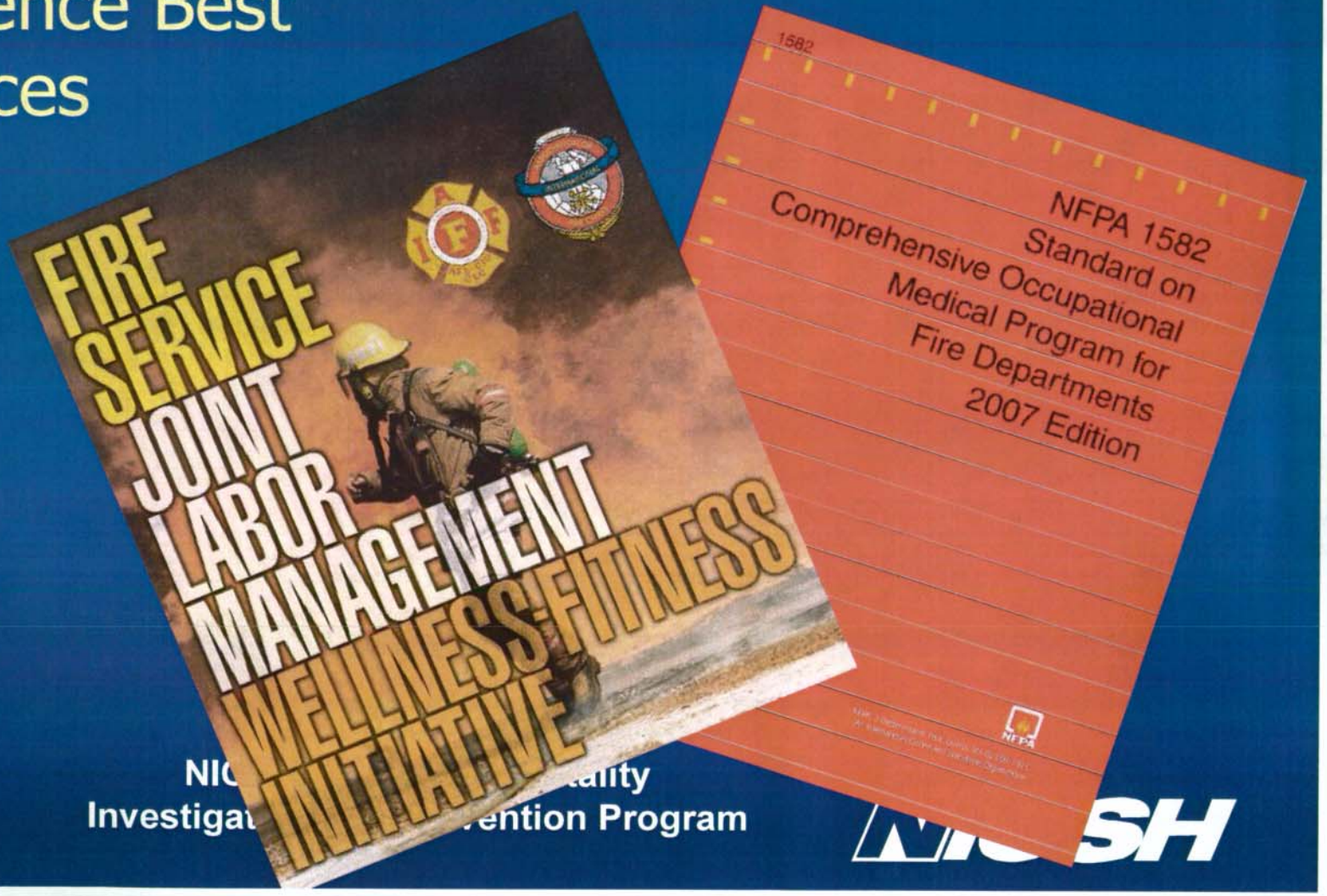
- Hypo- & Hyper-thermia
- Seizures, Diabetes, or medications
- Training
  - Emergency response
  - Physical fitness

Fighter Fatality Prevention Program

NIOSH

Cardiac Investigations & Reports

- Reference Best Practices



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Cardiac Investigations & Reports

- Non-fatal
- ~1000 on-duty non-fatal cardiac events
- 1 investigated

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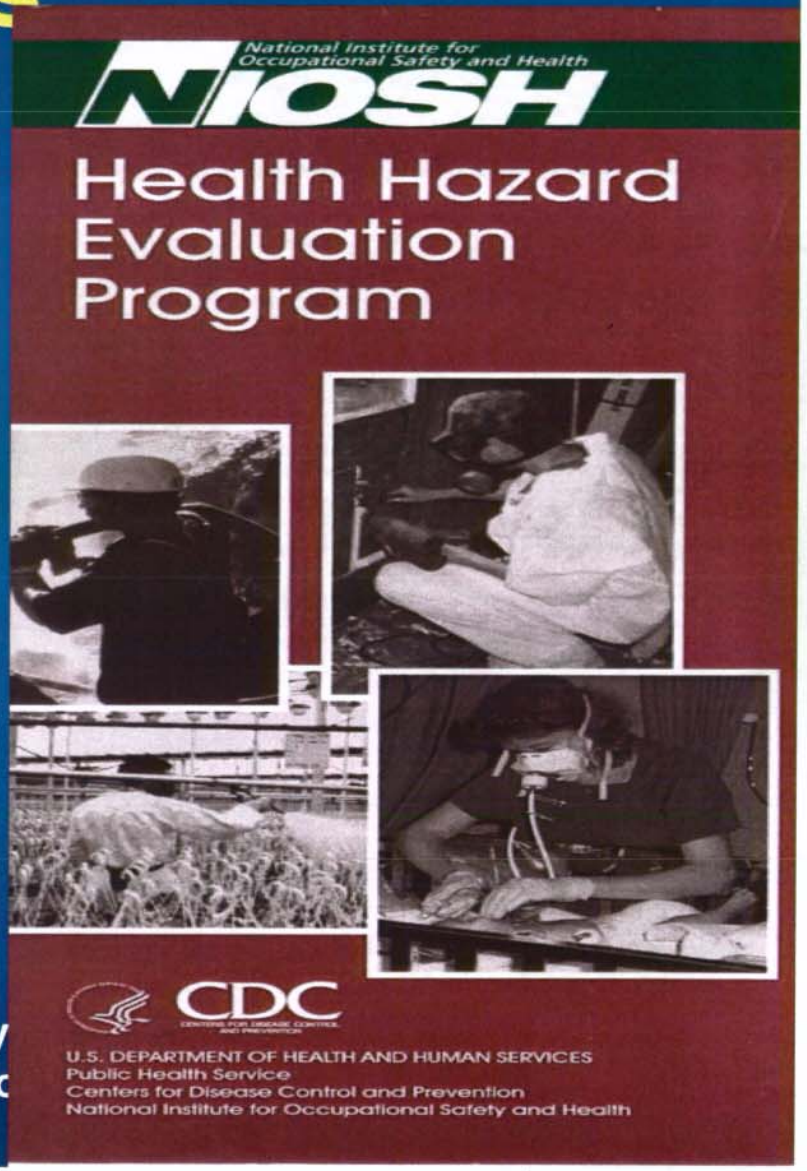
NIOSH Fire Fighter Fatality Investigation and Prevention Pro



Cardiac Investigations & Reports

- Timely reports
  - Site visit:
    - 6 months

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Investigations

- Timely reports
  - Site visit:
    - 6 months
  - Report
    - 4 months

National Institute for Occupational Safety and Health
NIOSH

F2008-31 Fire Fighter Fatality Investigation Team
Report Date: October 2008

Deputy Fire Chief Suffers Sudden Cardiac Arrest About One Hour After Conducting a Fire Prevention Inspection - California.

SUMMARY: On June 26, 2008, the Deputy Fire Chief reported to duty at 0800 hours. About three hours later he performed a fire prevention inspection of a local apartment building. Before returning to headquarters he stopped by one of the fire stations to visit with fellow fire fighters. While sitting at the kitchen table, the Deputy Chief collapsed. Despite immediate advance life support measures in the fire station, ambulance, and hospital emergency department, the Deputy Chief died. An autopsy performed by a forensic pathologist in the Office of the County Coroner concluded "left ventricular cardiac hypertrophy (years)" was the cause of death. The NIOSH investigator concluded that the Deputy Chief's sudden cardiac death was most likely due to a heart arrhythmia associated with high blood pressure, left ventricular hypertrophy, and an enlarged heart; a conclusion consistent with the County Coroner's autopsy report. The evidence does not suggest that the fire prevention inspection conducted by the Deputy Chief about an hour before his cardiac arrest triggered his heart arrhythmia.

The NIOSH investigator offers the following recommendations to reduce the risk of on-duty heart attacks and sudden cardiac deaths in this and other fire departments across the country. It is unlikely, however, that these recommendations could have prevented the Deputy Chief's sudden cardiac death.

- ***Ensure all uniformed members of the Fire Protection District receive annual medical and fitness evaluations.***
- ***Limit the number of consecutive shifts a fire fighter can work.***

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Investigations

- Timely reports
  - Site visit:
    - 6 months
  - Report
    - 4 months
  - Disseminate
    - 6 months

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NIOSH Fire Fighter Fatality Investigation and Prevention Program

Death in the line of duty...

A Summary of a NIOSH fire fighter fatality investigation — November 7, 2005

Fire Chief Suffers Sudden Cardiac Death While Returning to the Fire Station After a Structure Fire – Georgia

SUMMARY

On December 13, 2004, a 56-year-old male career Fire Chief responded to three fire calls, including two residential and one commercial fire. After the last fire, the Chief returned to the scene to "cordon off" the scene. As he was driving the rescue truck back to the fire station, he suddenly collapsed. The truck left the roadway, struck a culvert, and came to a stop. Witnesses called 911 and removed the Chief from the truck. Despite cardiopulmonary resuscitation (CPR) and advanced life support (ALS) performed by bystanders, crew members, ambulance service paramedics, and hospital emergency department (ED) personnel, the Chief died. The death certificate, completed by the Deputy Coroner, listed "cardiorespiratory arrest" due to "ASCVD" (atherosclerotic cardiovascular disease) as the cause of death. No autopsy was performed. The NIOSH investigator concluded the physical stress of responding to three structure fires, assisting with on-scene operations, and the Chief's underlying atherosclerotic cardiovascular disease all contributed to his sudden cardiac death.

NIOSH investigators offer the following recommendations to prevent similar incidents or to address general safety and health issues:

Provide pre-placement and annual medical evaluations to ALL fire fighters to determine their medical ability to perform duties without presenting a significant risk to the safety and health of themselves or others.

Consider including exercise stress tests (EST) for male fire fighters over the age of 45 years with two or more risk factors for coronary artery disease (CAD) as part of the annual medical evaluation.

Phase in a mandatory wellness/fitness program for fire fighters to reduce risk factors for cardiovascular disease and improve cardiovascular capacity.

Ensure that fire fighters are cleared for duty by a physician knowledgeable about the physical demands of fire fighting, the personal protective equipment used by fire fighters, and the various components of NFPA 1582, Standard on Comprehensive Occupational Medicine Program for Fire Departments.

Perform an annual physical performance (physical ability) evaluation to ensure fire fighters are physically capable of performing the essential job tasks of structural fire fighting.

Use a secondary (technological) test to confirm appropriate placement of the endotracheal (ET) tube during emergency intubations.

Perform an autopsy on all on-duty fire fighter fatalities.

Provide fire fighters with medical evaluations and clearance to wear self-contained breathing apparatus (SCBA).

Consider annual respirator fit testing.

The Fire Fighter Fatality Investigation and Prevention Program is conducted by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the program is to determine factors that cause or contribute to fire fighter deaths suffered in the line of duty. Identification of causal and contributing factors enable researchers and safety specialists to develop strategies for preventing future similar incidents. The program does not seek to determine fault or place blame on fire departments or individual fire fighters. To request additional copies of this report (specify the case number shown in the shield above), other fatality investigation reports, or further information, visit the Program Website at www.cdc.gov/niosh/fire.html or call toll free 1-800-35-NIOSH

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NIOSH Fire Fighter Investigation and Preven

2006 Stakeholder Meeting
Future Directions

- Investigations
- Documents
- Dissemination
- Outreach
- Research
- Evaluation
- Tech Asst

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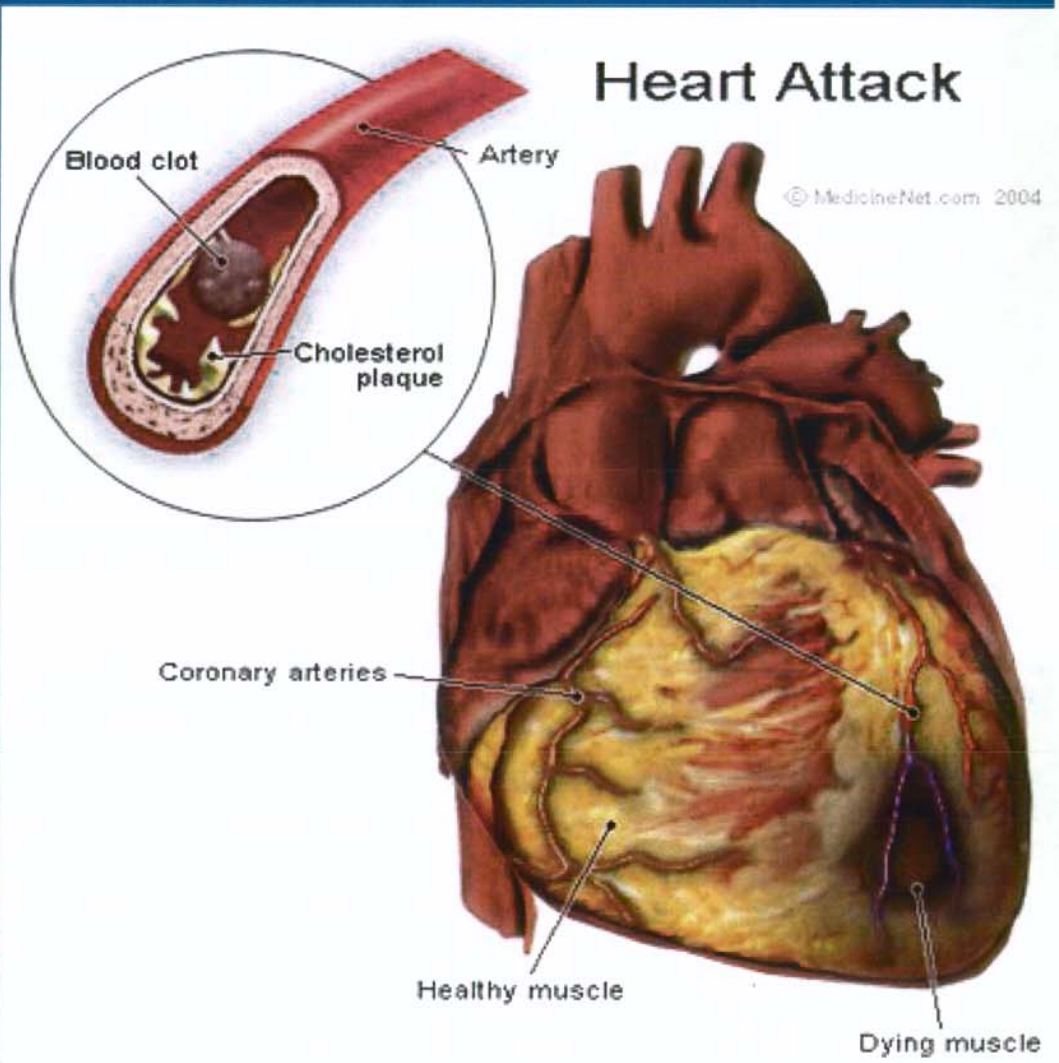
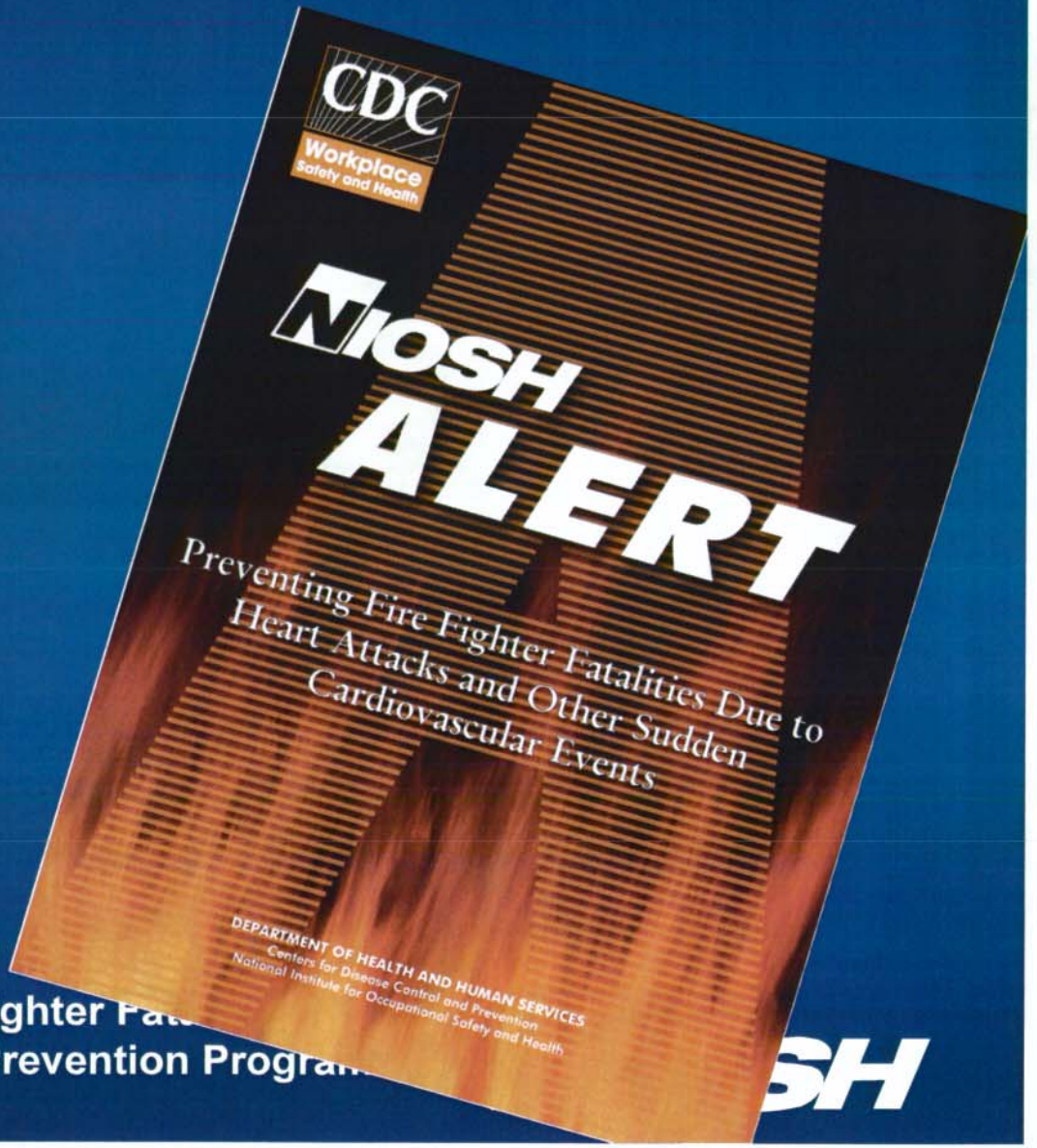


Documents

- NIOSH
  - –Alerts



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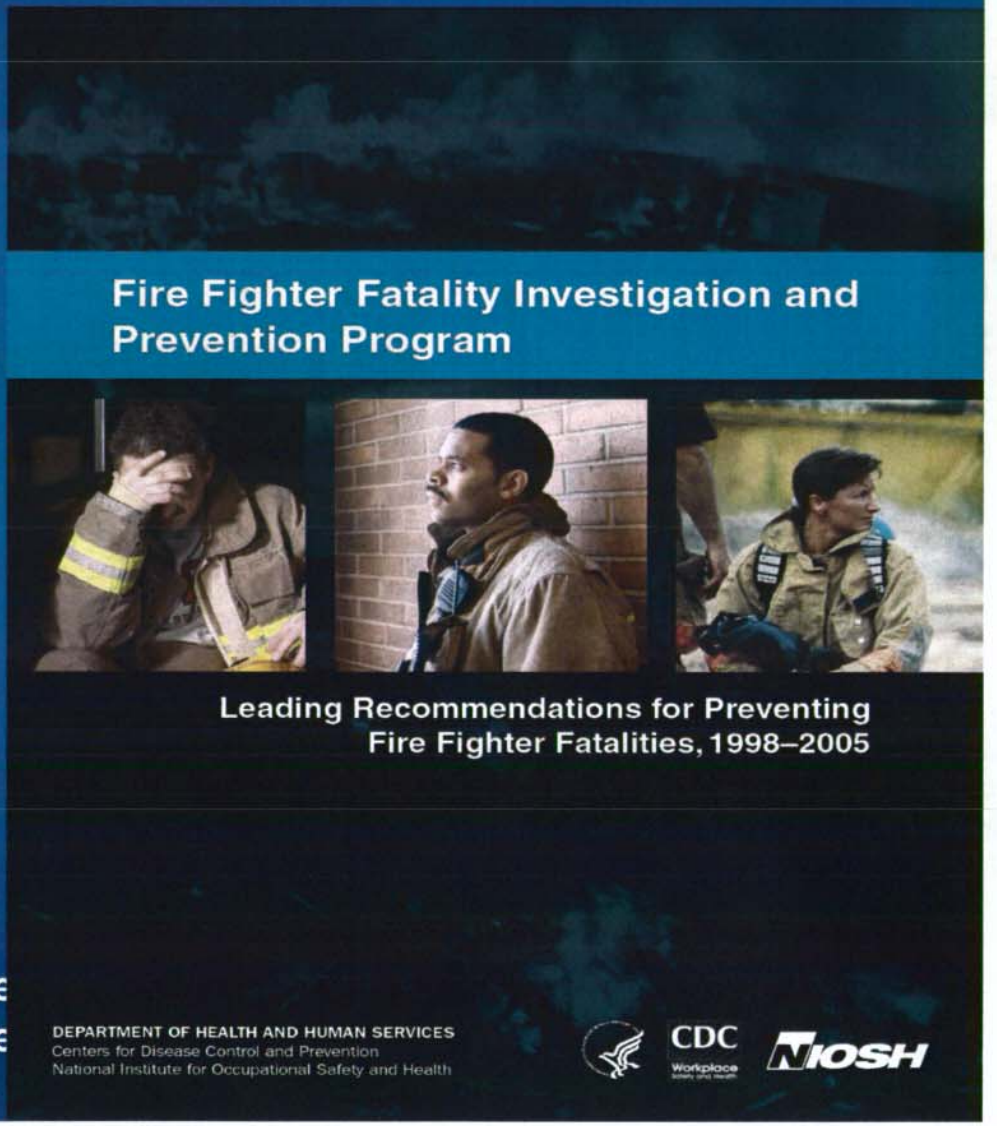
Documents

- NIOSH
  - –Alerts
  - –Technical document



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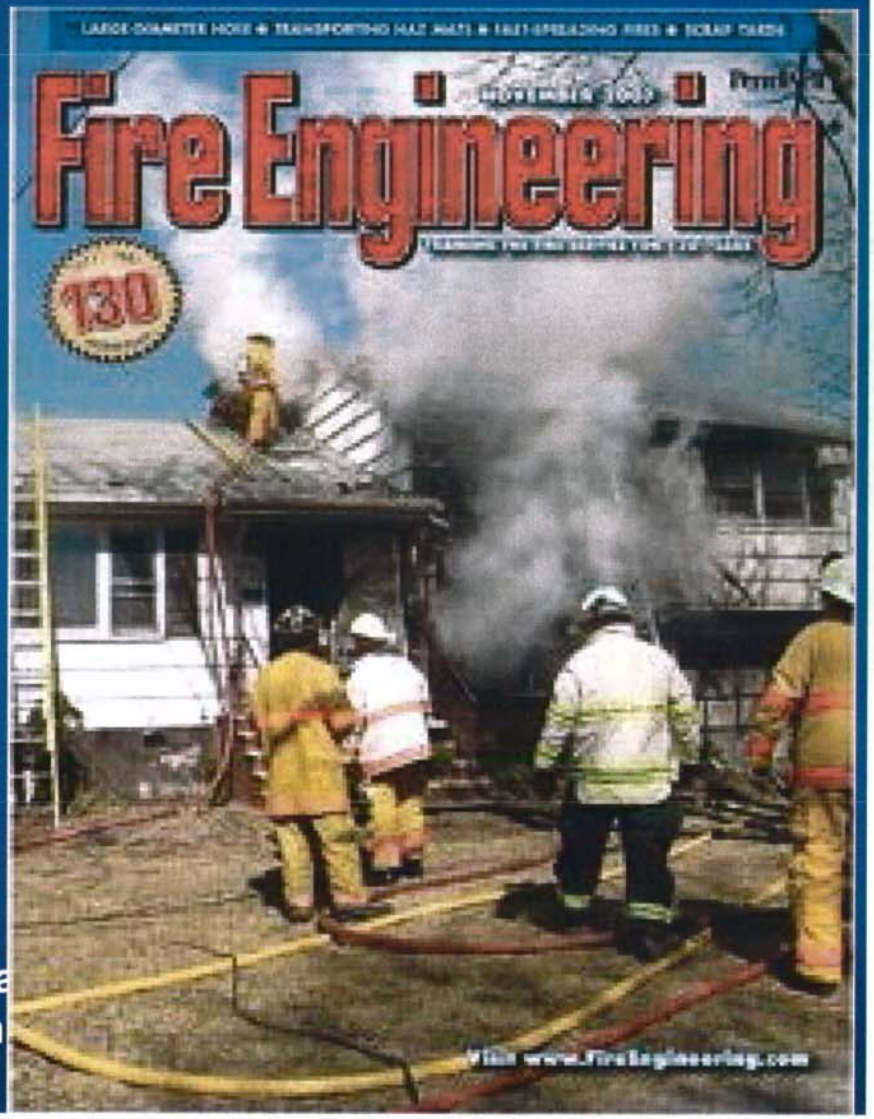
Documents

- NIOSH
  - Alerts
  - Technical Documents
- Trade Journals



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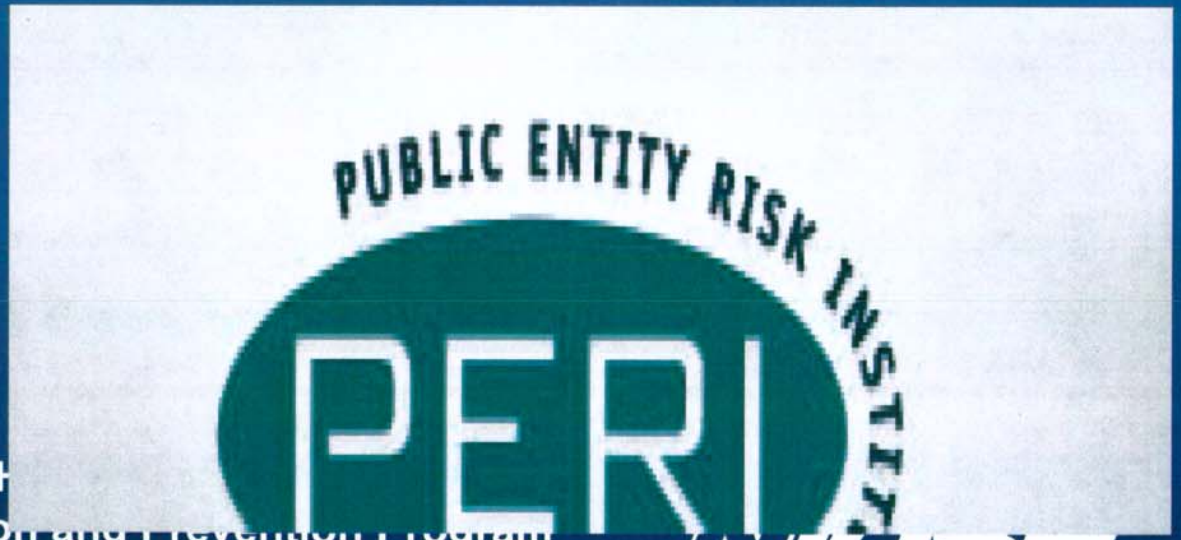
Documents

- NIOSH
  - Alerts
  - Technical Documents
- Trade Journals
- Blog
  - NIOSH
  - PERI



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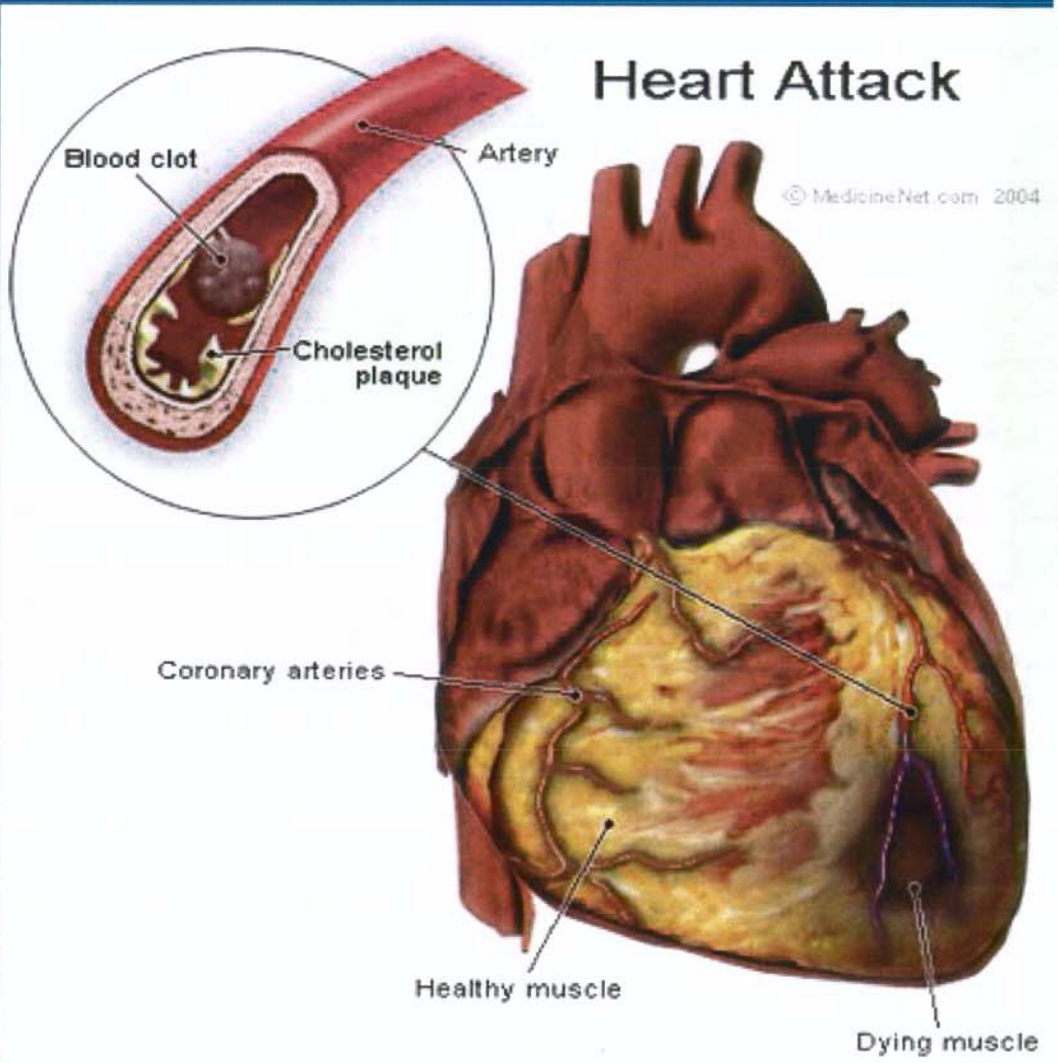
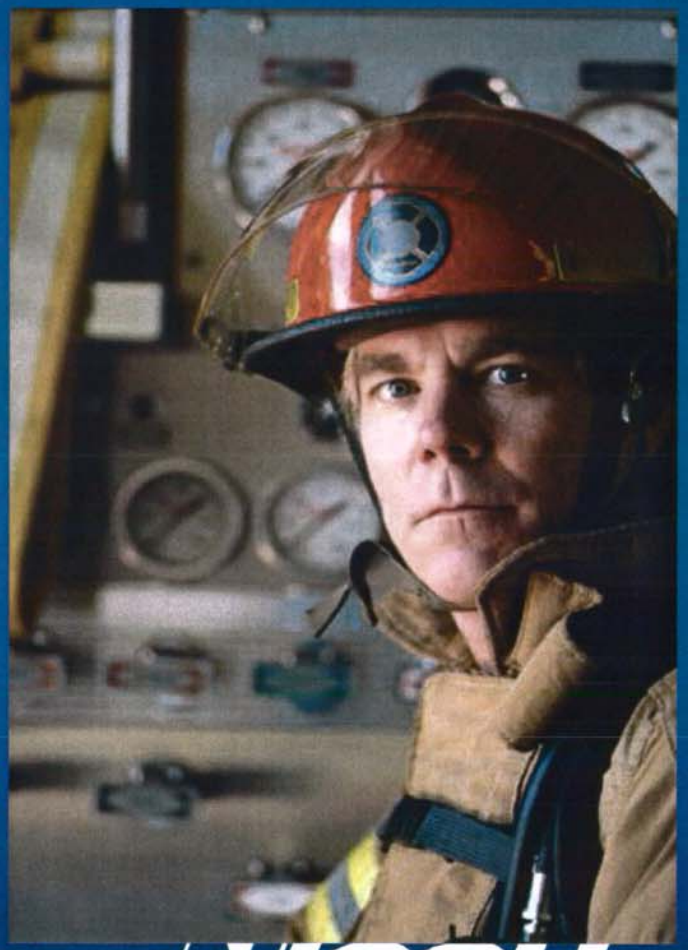


Outreach

- Presentations
  - NFPA
  - IAFF Redmond
  - IAFC
  - CFSI
  - TRADE – National Fire Academy
- NVFC
  - Wellness and fitness programs



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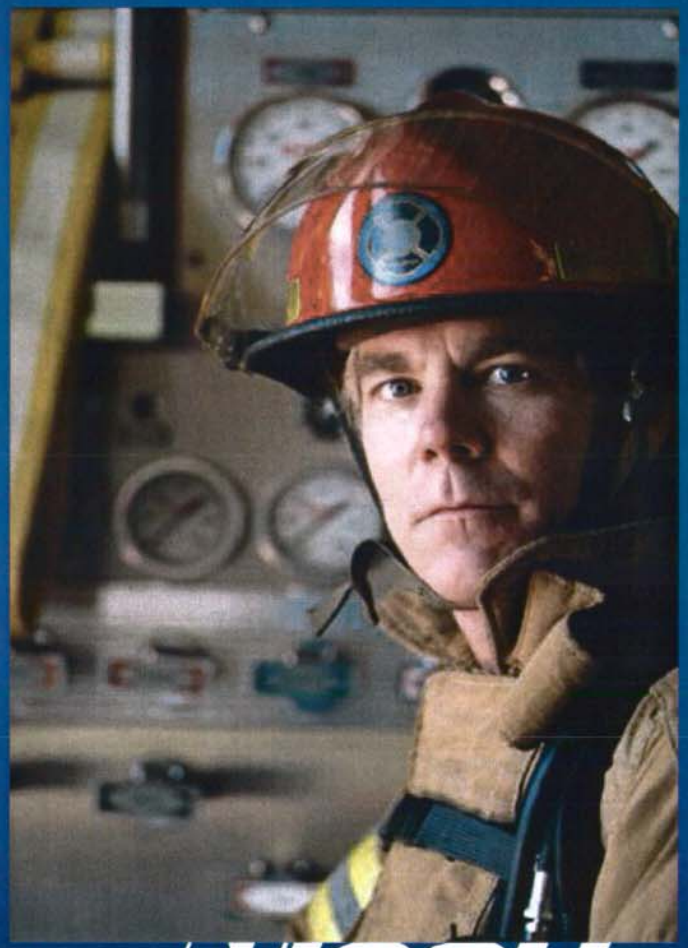
Outreach

- NFPA – Technical Committee
  - 1581 – Infection Control
  - 1582 – Occup Med Prgm
  - 1584 – Rehabilitation
- IAFF HazMat/WMD Advisory Board
- FF Cancer Support Network



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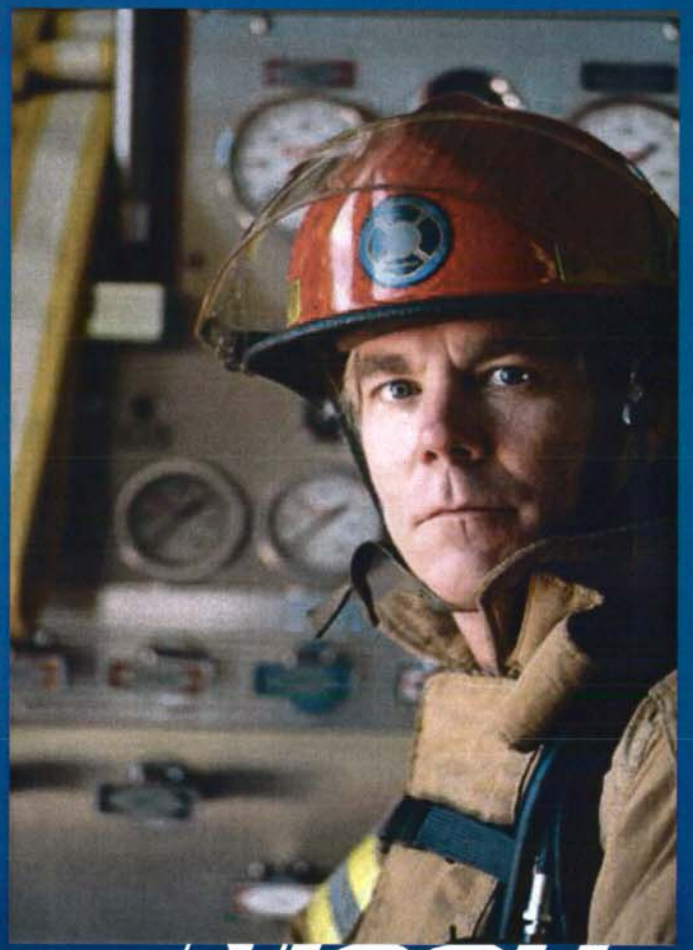
Outreach

- Attended Conferences/Mtgs
  - FDIC
  - NFFF
    - Life Safety Summits



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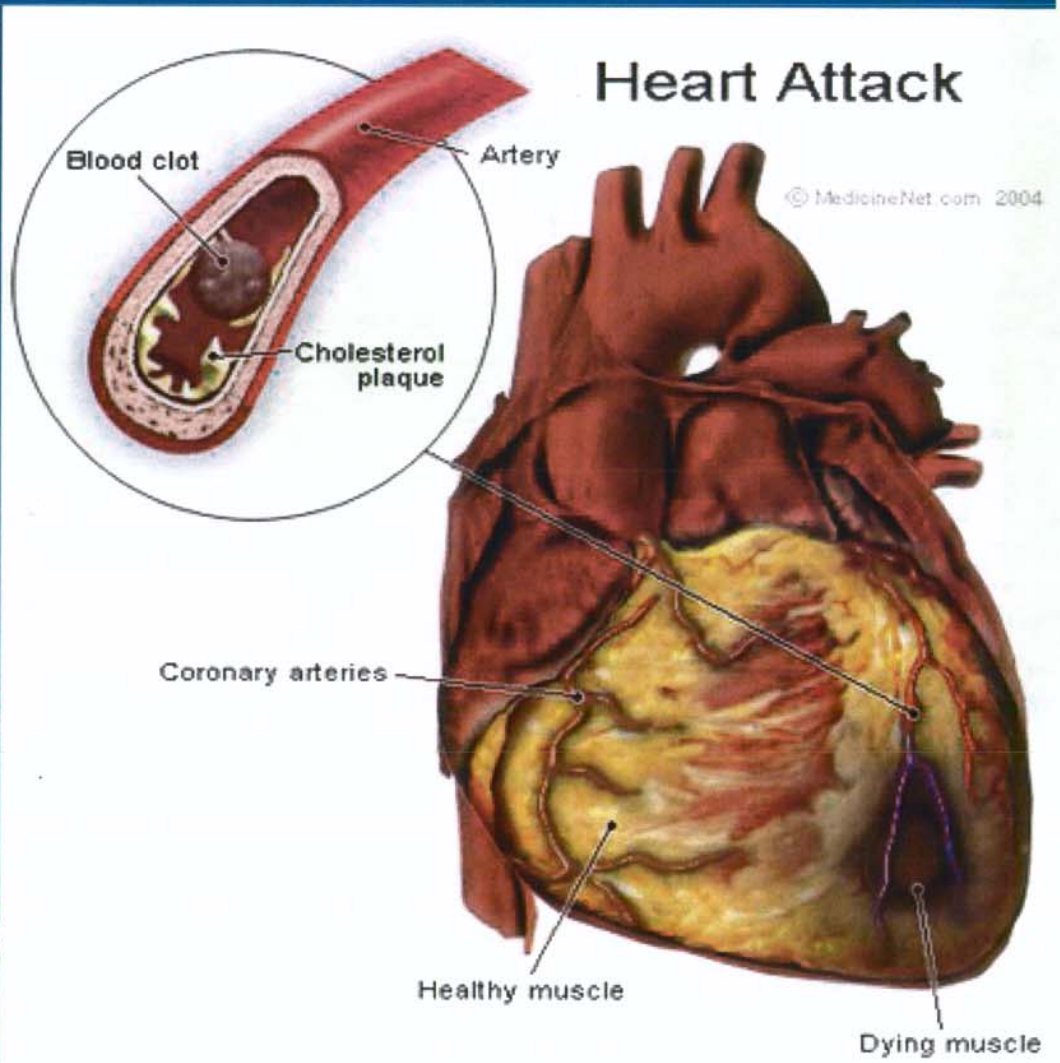

Research

- Leverage resources to conduct research
  - External to NIOSH

DHS Fire Act Grants-
Firefighter Safety Research and Development Activity – reviewers

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Research - Internal

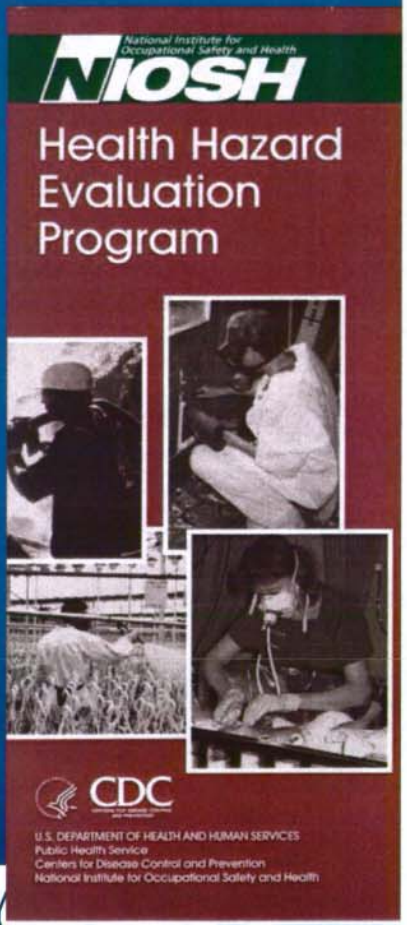
NIOSH NORA

- Cancer and heart disease study

NIOSH HHE program

- Cyanide – Providence FD
- Exposures during motor vehicle fire suppression
- CO exposure during water rescue with Jet boats
- Heavy metals exposures

NORA



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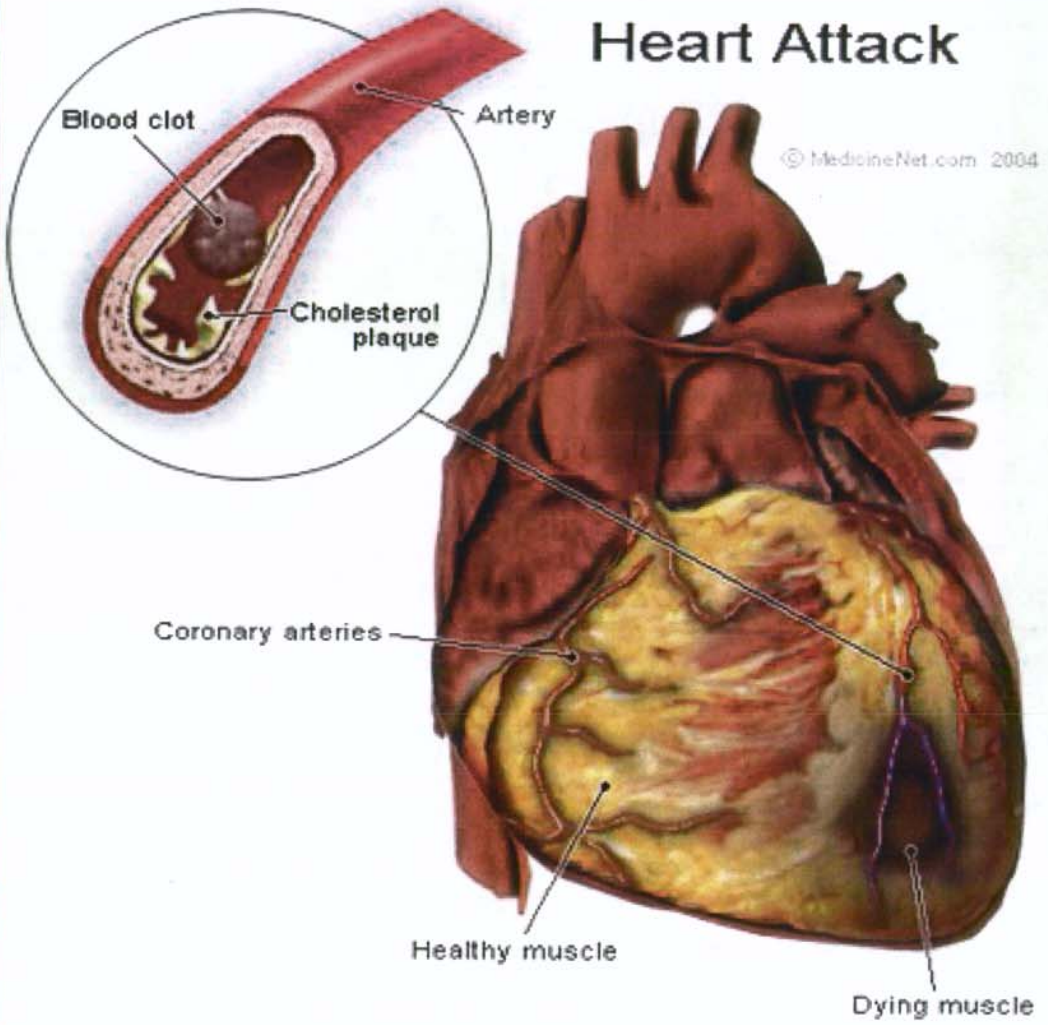

Pilot Surveys to Assess Impact of the NIOSH FF Program

- Report
- 1-year After Report

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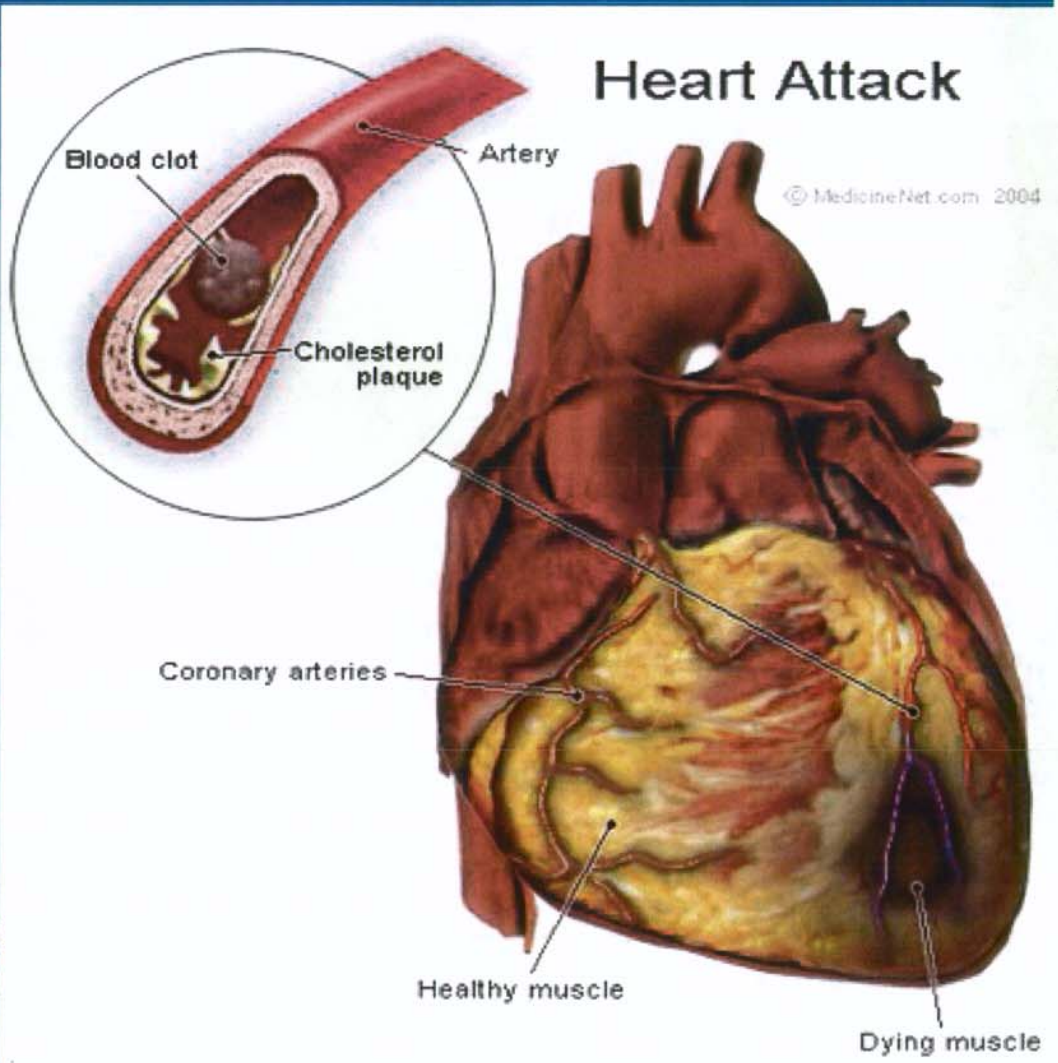

Technical Assistance

- Info to FD not getting an investigation

All FD with CVD Fatality get a telephone call

Share resources at that time

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The findings and conclusions in this presentation have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

CDC Workplace Safety and Health

NIOSH Fire Fighter Fatality Investigation and Prevention Program

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