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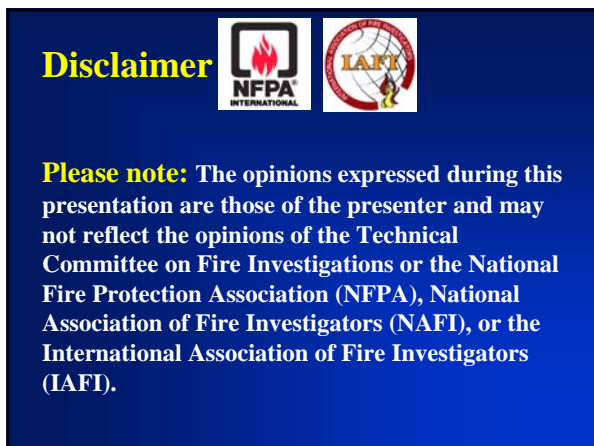
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### Fire Investigator Safety Series

The "Fire Investigator Safety Series" will be comprised of four programs that will provide the participants an opportunity to explore the common health and safety hazards found on the fire and explosion investigation scene and during subsequent evidence inspections and other post scene analysis.

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### Fire Investigator Safety Series

Through this exploration process the participant will be able to put control mechanisms in place to eliminate hazards or limit potential exposure to those working on the fire or explosion scene or during post scene activities.



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### Series 3: Personal Protective Equipment (PPE), Selection and Use

This session will review the broad categories of PPE, the need to utilize the hierarchy of the control mechanisms, the completion of a PPE Assessment in order to identify the most suitable PPE and a summary of the training and other requirements to ensure that the equipment is utilized properly.

August 12, 2014

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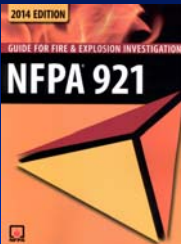
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**References**

Guide for Fire & Explosion Investigations, NFPA 921 2014 Edition, Chapter 13

NFPA 1500 Standard on Fire Department Occupational Safety and Health Program, 2013 Edition

OSHA Standards 1910 and 1926




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**Participant Resources and References**

A number of course references and resources have been placed online for download.

[www.tracefireandsafety.com](http://www.tracefireandsafety.com)



Once there follow the link that is located in the lower left side pane.

**IAFI Fire Investigator Safety Resources**

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## Chapter 18 Origin Determination

### 18.3.1.1 Safety Assessment

The investigator should first make an initial safety assessment. The investigator should determine if it is safe to enter the scene. If it is not safe to enter, the investigator must determine what steps are required to provide for personal safety or to render the scene safe to enter. Each of the hazards described in Chapter 13 should be assessed. There is no reason the investigator should compromise safety.

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## 29CFR1910 Subpart I: PPE

### 1910.132 General requirements

(d) Hazard assessment and equipment selection.

(1) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

- (i) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;
- (ii) Communicate selection decisions to each affected employee; and
- (iii) Select PPE that properly fits each affected employee.

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## Why make the workplace safer?

- Health and Safety of those investigating fire and explosion scenes.
- It makes good business sense and is cost effective.
- Duty of care to employees, contractors, and other investigators can be undertaken, and so health and safety legal requirements can be met.

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**A. Williams-Steiger Occupational Safety and Health Act, 1970**

“To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes.”

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**B. General Duty Clause**

Section 5: Duties

(a) Each employer

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

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### C. OSHA and the Fire Investigator

An interesting story.....



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### “Once upon a time.....”



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### C. OSHA and the Fire Investigator

A fire investigator was investigating a large loss in a small town. He did all of the necessary steps, including hiring casual laborers to dig out the debris, a contractor to provide heavy equipment and a private security firm to keep unauthorized people off of the property. At the end of the investigation, the fire investigator left the site feeling satisfied that he had done a good job of analyzing the facts of the event.”



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**C. OSHA and the Fire Investigator**

“ However, three weeks after the fire scene examination was complete, a representative of the Federal Government arrived and evaluated the fire investigator's work. Based on what this representative of the Federal Government saw and learned from interviewing the fire investigator, he cited the fire investigator's employer for violation of federal regulations pertaining to employee safety in the workplace. **The citation was not contested and the fine was substantial.**”



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**C. OSHA and the Fire Investigator**

“Does this sound like a fairy tale or something that is not possible today?”



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**C. OSHA and the Fire Investigator**

It is the truth!

**Fire Investigator:** Dan Churchward

**Federal Government Employee:** OSHA Compliance Officer

**Citation:** Failure to have a written HazCom Program and Failure to warn of the hazards of Silica (sand).

**Fine:** Several Thousand Dollars

**Source:** OSHA and the Fire Investigator by Daniel. L. Churchward "The National Fire & Arson Report," December 1995 - Volume 13, No. 4



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### D. OSHA Multi-Employer Worksite

Directive Number: CPL 2-0.124  
Subject: Multi-Employer Citation Policy  
Date of Directive: December 10, 1999

Controlling            Creating  
Exposing             Correcting  
Employers

[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=DIRECTIVES&p\\_id=2024](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=2024)

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### D. OSHA Multi-Employer Worksite

- Creating Employer
- Exposing
- Correcting
- Controlling Employer



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### D. Causes of Accidents and Illnesses



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### Causes of Accidents and Illnesses




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### II. Hazard and Risk Assessment, the Process




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### Hazard Identification, Risk Assessment, and Hazard Control

Purpose:

To ensure that there is a formal process for hazard identification; risk assessment and control to assist in effectively manage hazards that may occur within the workplace.

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### Key Terminology

#### Hazard:

Anything (e.g. condition, situation, practice, behavior) that has the potential to cause harm, including injury, disease, death, environmental or property and equipment damage.



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### Key Terminology

#### Hazard Identification:

This is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job” (Task).

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### Key Terminology

#### Risk:

The likelihood or probability that a hazardous event (with a given outcome or consequence) will occur.



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**Key Terminology**

**Risk Assessment:**

Can be defined as the process of assessing the risks associated with each of the hazards identified so that appropriate control measures can be implemented based on the probability, ie. likelihood that harm, injury or ill health may occur and how severe the consequences of exposure might be.

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**Key Terminology**

**Risk Control:**

This is the process of identifying and implementing the most cost effective risk control measures having regard to the Hierarchy of Control Principle.

**Engineering, Administrative, and Personal Protective Equipment**

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**Key Terminology**

**Monitoring and Review (Audit):**

This involves ongoing monitoring of the hazards identified, risk assessment and risk control processes and reviewing them to make sure they are working effectively.

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### Hazard and Risk Assessment

1. Identify the Hazards
2. Assess the Risk
3. Control the Hazard
4. Audit

Monitor and Re-Evaluate

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### Hazard and Risk Assessment

NAFI SAMPLE HAZARD AND RISK ASSESSMENT				
Location:	Date:			
Work/General Safety Survey:	Assessment Conducted By:			
Type of Hazard	Risk	Control Method/Owner		
A. Physical Hazards	HMI	Engineering	Administrative	PPE
B. Structural Hazards				
C. Electrical Hazards				
D. Chemical Hazards				
E. Biological Hazards				
F. Mechanical Hazards				

FIGURE A.12.4.1 Sample Hazard and Risk Assessment.

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### Step 1: Identify Hazards

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### A. Physical Hazards

- Slip, Trip, and Fall
- Sharp Surfaces
- Broken Glass
- Environmental Hazards
  - Temperature Extremes
  - Fatigue
  - Strenuous Physical Activity




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When there is a will there is a way!




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### Fall Hazards




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**Fall Protection Required?**



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**Fall Protection Acceptable?**



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**Fall Protection?**



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**Fall Protection Required?**



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**Scaffolding?**



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**Fall Protection or a Life Jacket?**



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### Physical Hazard?

- Vehicle Fire Investigation



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### B. Structural Hazards



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**Structural Hazards?**



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**Structural Hazards?**



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**Structural Hazards?**



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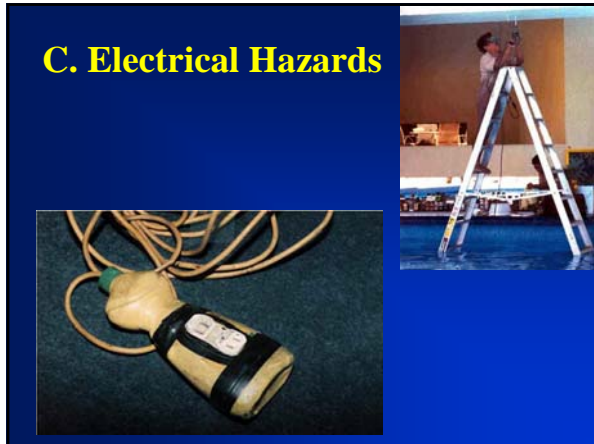
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### Electrical Hazards?



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### C. Electrical Hazards

- Isolate Area
- Proper Tools and Equipment
- GFCIs
- Intrinsically Safe



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### D. Chemical Hazards



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**Safety Data Sheets (SDS)**

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What is in the container?

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**Labels, Tags and Markings**

The employer must ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following:

- Identity of the hazardous chemical
- Appropriate hazard warnings

- This above labeling information is required of the manufacturer so the employer must ensure that the original labels from the manufacturer are on all containers and remain legible.

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### Global Harmonization System

<https://www.osha.gov/dsg/hazcom/index.html>

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### How must chemicals be labeled?

1. Product Identifier
2. Signal Word
3. Hazard Statements
4. Precautionary Statements
5. Supplier Information
6. Pictographs

**The Basic Parts of a GHS-Compliant Label**

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### How must chemicals be labeled?

**The Basic Parts of a GHS-Compliant Label**

1. **Product Identifier** - Should match the product identifier on the Safety Data Sheet.
2. **Signal Word** - Either use "Danger" (severe) or "Warning" (less severe).
3. **Hazard Statements** - A phrase assigned to a hazard class that describes the nature of the product's hazards.
4. **Precautionary Statements** - Describes recommended measures to minimize or prevent adverse effects resulting from exposure.
5. **Supplier Identification** - The name, address and telephone numbers of the manufacturer or supplier.
6. **Pictographs** - Graphical symbols intended to convey specific hazard information visually.

Sample label courtesy of Miller Packaging Solutions - [www.millerpackaging.com](http://www.millerpackaging.com)

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**GHS Pictographs**

**Globally Harmonized System  
Hazard Communication**

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**Exclamation Mark**



- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity (harmful)
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer

Health Hazard!

(Non Mandatory)

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**Health Hazard**



- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Greater Health Hazard

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### Skull and Crossbones



Severe Health Hazard

- Acute Toxicity (fatal or toxic)

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### Flame



- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self-Reactives
- Organic Peroxides

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### Flame Over Circle



- Oxidizers

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### Exploding Bomb



- Explosives
- Self-Reactives
- Organic Peroxides

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### Corrosion



- Skin Corrosion/ burns
- Eye Damage
- Corrosive to Metals

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### Gas Cylinder



- Gases under Pressure

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**Environment,  
(Non Mandatory)**



- Aquatic Toxicity

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**Biological Hazard?**



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**Biological Hazard?**



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**Biological Hazard?**



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## Biological Hazards

Storage and Disposal



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## F. Mechanical Hazards

Lock Out/Tag Out  
Zero Mechanical State



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## F. Mechanical Hazards

Lock Out Tag Out  
Zero Mechanical State  
Technical Assistance



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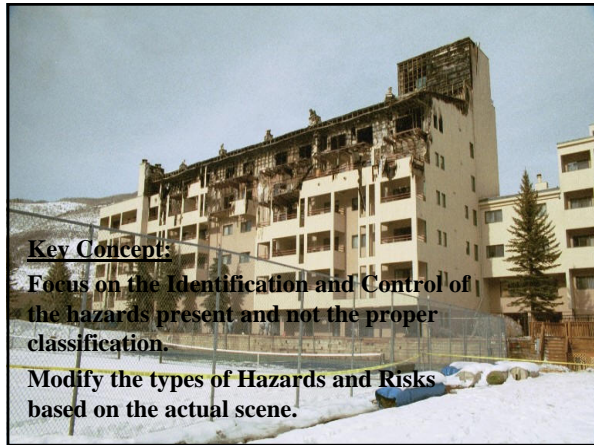
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**Key Concept:**

Focus on the Identification and Control of the hazards present and not the proper classification.

Modify the types of Hazards and Risks based on the actual scene.

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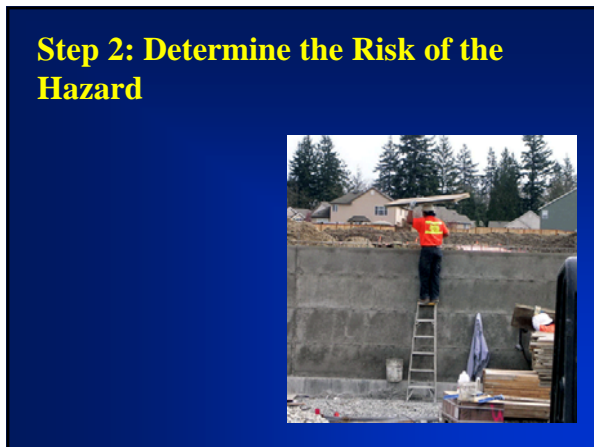
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**Step 2: Determine the Risk of the Hazard**



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## Step 2: Determine the Risk of the Hazard

Rating	Impact	Probability
<b>High</b>	Disabling injury, loss of body part, or fatality	<ul style="list-style-type: none"> <li>•Repetitive Event</li> <li>•Greater than 50% chance of occurring</li> <li>•Has happened frequently in similar circumstances</li> </ul>
<b>Medium/ Moderate</b>	Medical Aid Injury	<ul style="list-style-type: none"> <li>•Infrequent Event</li> <li>•10-50% chance of occurring</li> </ul>
<b>Low</b>	First Aid Injury	<ul style="list-style-type: none"> <li>•Unlikely Event</li> <li>•Less than 10% chance of occurring</li> <li>•Has never been observed but is still felt to be possible.</li> </ul>

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### Risk Assessment Matrix based on FM 5-19

RISK ASSESSMENT MATRIX						
Severity	Probability					
	Frequent A	Likely B	Occasional C	Seldom D	Unlikely E	
Catastrophic	I	E	E	H	M	
Critical	II	E	H	H	M	
Marginal	III	H	M	M	L	
Negligible	IV	M	L	L	L	
E-Extremely High		H-High		M-Moderate		L-Low

FM 5-19 and FM 100-14 are located in the course resources

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## Determine the Risk

- US Army Risk Management Matrix

Risk Management						
RM MATRIX		HAZARD PROBABILITY				
		Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
SEVERITY	Catastrophic I	EXTREMELY HIGH				
	Critical II	HIGH				
	Marginal III	MODERATE				
	Negligible IV			LOW		

US Army Risk Management Card is located in the course resources.

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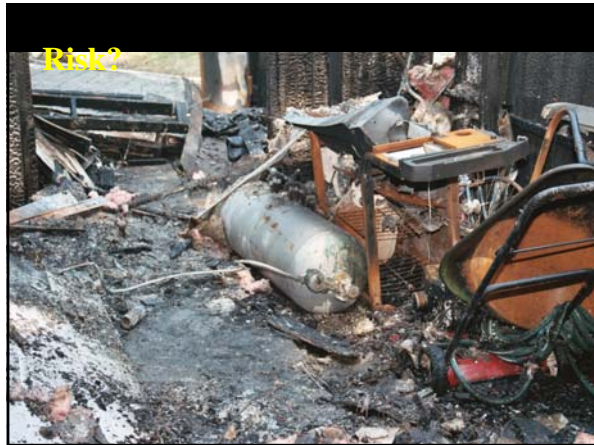
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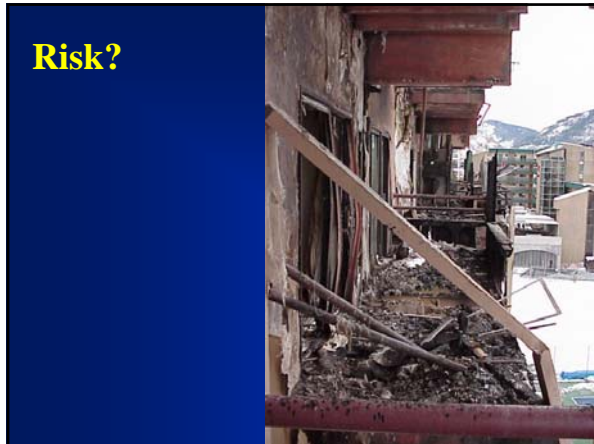
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**B. Administrative Controls**

- Isolation of Area
- Signs, Cones, Barrier Tape
- Specialized Resources
- Work Practices



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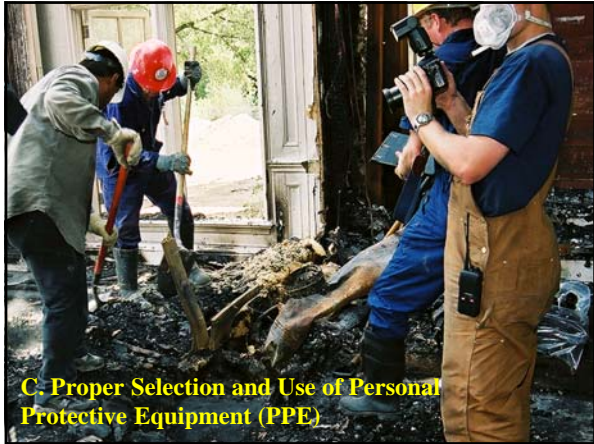
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C. Proper Selection and Use of Personal Protective Equipment (PPE)

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**C. Proper Selection and Use of Personal Protective Equipment (PPE)**

**Cowboy after O.S.H.A.**

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**PPE**

Eye	Safety Glasses, UV
Face	Face Shield
Head	Hard Hat, Helmet
Feet	Safety Shoes, Boots
Hands & Arms	Gloves
Body	Vests, Aprons, Chemical Suit
Hearing	Earplugs, Canal Caps, Earmuffs
Respiratory	APR, PAPR, SCBA, Air Supplied

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**Step 4: Monitor and Re-Evaluate the Hazards as time and conditions change**



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**III. Conclusions**

It is up to us to make a difference and cause change.



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**Causes of Accidents and Illnesses**



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### Document the Process!

NAFI SAMPLE HAZARD AND RISK ASSESSMENT				
Location:		Date: _____ Assessment Conducted By: _____		
Task: General Safety Survey				
Type of Hazard	Risk	Control Methodology		
A. Physical Hazards	HIM L	Engineering	Administrative	PPE
B. Structural Hazards				
C. Electrical Hazards				
D. Chemical Hazards				
E. Mechanical Hazards				
F. Environmental Hazards				
G. Other Hazards				
H. Other Hazards				
I. Other Hazards				
J. Other Hazards				
K. Other Hazards				
L. Other Hazards				

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How many of you look in the mirror in the morning and say, "Today, I could get hurt at work" or "Today, I am going to do everything possible to prevent getting hurt at work"?




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### Fire Investigator Safety:

Uninformed,  
Under Informed,  
or Complacent



Ron Hopkins, MS, CFEI, CFPS, F-IAFI  
TRACE Fire Protection and Safety  
Richmond, Kentucky  
www.TRACEfireandsafety.com

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